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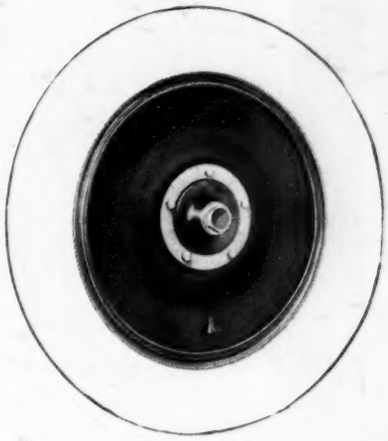

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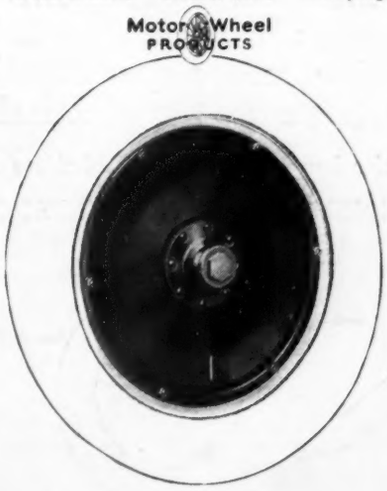


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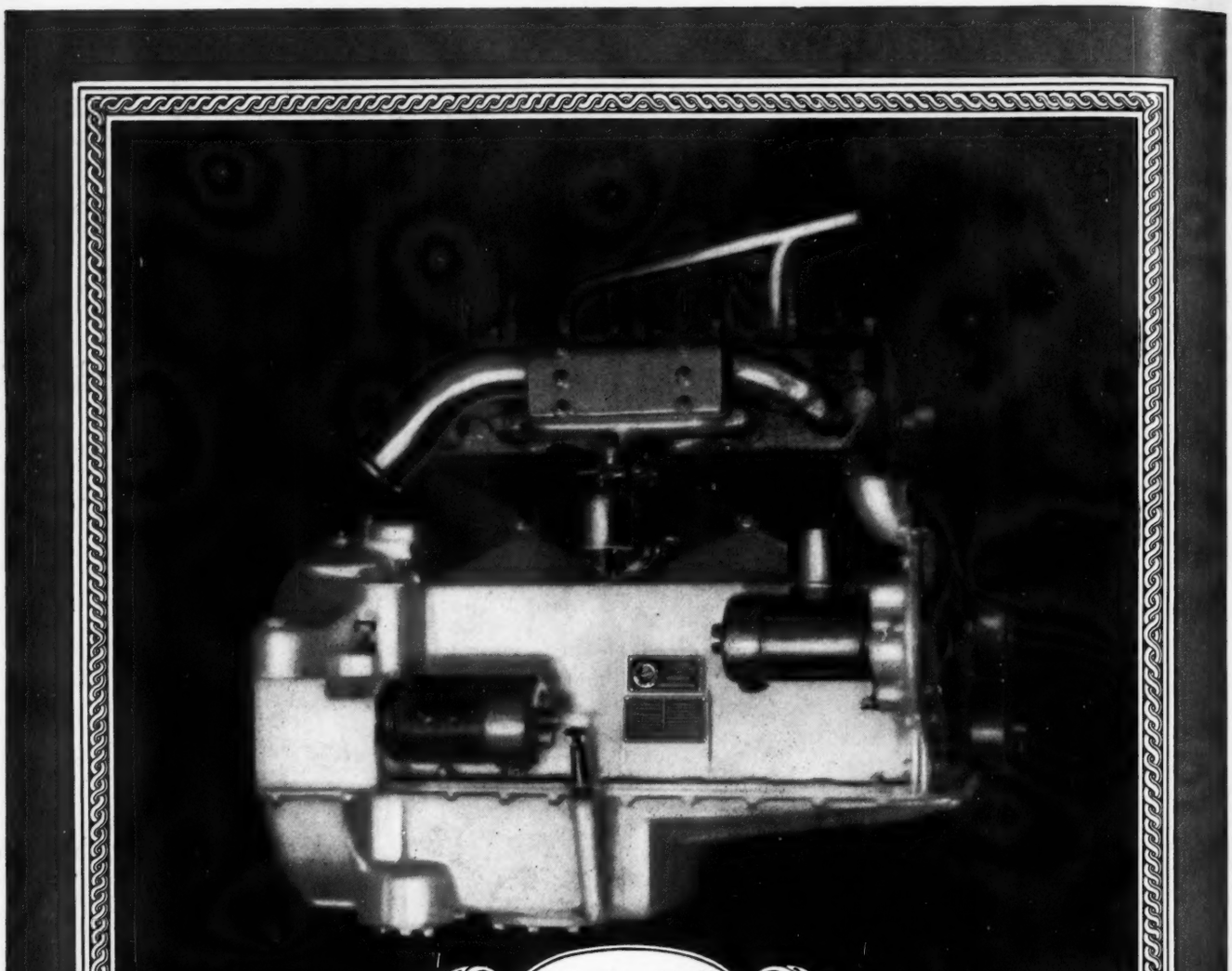

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AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. XLIX NEW YORK—THURSDAY, AUGUST 16, 1923 No. 7

# Narrow View of Power Farming Blights Tractor Trade

**Machine expected to replace horses must be general utility implement. Plowing only small part of necessary work. Service, greatest factor in selling, should be carried to the man who buys. Price an important consideration in rural regions.**

By W. L. Carver

JUST what is the status of American agricultural tractor seems to be a question in the minds of those who have been engaged in the business of making or selling these farm implements. It is also to be supposed that the same question exists in the mind of the American farmer. During the late war, the tractor manufacturer became accustomed to a front page location and his product took on great importance in any discussion of public welfare. There was much talk of government control of the industry in order to regulate output to best suit the needs of the maximum production of food stuffs. Production was limited only by the supply of materials which could be obtained after the requirements for munitions had been fulfilled.

Today, the industry is confronted by an entirely different picture. As represented by about thirty-five fairly prominent concerns, current commercial activities are almost at the point of stagnation at a time when nearly every other form of industrial activity is under full speed ahead. Decrying the efforts of competition will avail nothing. It is more than probable that something of tangible commercial value may be learned from this selfsame competition. The shortcomings of a commercial or industrial organization do not seem important during a period of prosperity but they surely strike home when the going becomes difficult. There is also the probability of acquiring false ideas of economic values.

Before the war with its acceleration of all national activities, the tractor business was a relatively limited proposition. A few permanent companies had fought an uphill battle, selling tractors rather than the big idea of power farming and were fairly well established in the field. Nevertheless, those who were in the business at that time can recall the reaction against the big tractor which occurred during 1913. The unfenced, gigantic prairie wheat farm no longer constituted the backbone of the tractor market. An increasing demand for the smaller machine turned the efforts of the manufacturer from the 8-12 plow tractor to the smaller unit of four plow capacity and eventually 2/3 plows and, in some cases, one.

THIS change was brought about by an economic influence and obviously leads to the question of whether the economic status of the farm and farming methods necessitates another readjustment. At the same time, it must be remembered that the war and its aftermath of readjustment have affected the industrial and agricultural aspects of every nation. In the light of these influences, any consideration of the agricultural tractor and its market as related to the majority of manufacturers now in the field, becomes rather complicated. Farmers are not buying them. Is it because they can't afford them? Wheat is away down but farm labor is away up. The tractor is said to reduce farm labor costs and make work easier

and faster. This would seem all the more reason for their purchase, if production must be maintained or increased.

A brief discussion of the changes which have taken place along economic and social lines will serve to indicate their influence on the tractor market. Prior to the war, this country exported vast quantities of wheat and other farm products to the manufacturing nations of Europe. Under conditions of stable demand and foreign exchange rates, this was a consistent business of large volume which might be likened to the flywheel on the engine of American agricultural production in smoothing the peaks of the output curve into a fairly regular line. In fact, it has been stated that the exportation of cheap grain had a great part in bringing on the world conflict as it permitted the nations of Europe to divert an inordinate share of their national effort to the manufacture of the various sinews of war.

NOW this situation is almost reversed. During the war every available square foot of European soil was utilized for the production of food stuff and much of this effort has been maintained since. Devastated areas have been rehabilitated and are producing according to modern standards. Then there is the regrettable fact that the war cost the lives of about thirty millions of people and the reduced consumption. On top of these facts is the present exchange rate which has driven those countries to the production of their own food-stuff which may be purchased at something like the internal standard of values. There has also been the incentive for the elimination of imports as one method of restoring exchange values.

**THE tractor industry is affected partly by general economic changes and partly by factors within its own boundaries. A good market for tractors seems to exist, fundamentally speaking, but many difficulties appear to be in the way of actual sales.**

**This article tells about some of the chief hindrances to better business in the tractor industry and makes some constructive suggestions for improvement.**

In this country, another economic trend has affected rural communities with a consequent influence on the tractor market. The depression of 1921 sent more than two million people back to the farm and only a portion of them have returned to the manufacturing centers during the present rise in industrial activity. Economic influences have forced up the average individual wage in our manufacturing centers therefore, and in the face of present competition, manufacturers are devoting all their energies to the development of labor saving devices of every kind. It is a question of survival with the manufacturer and will in the end work out to the greatest advantage of the nation at large since prodigality of either man power or material can not bring about the greatest welfare of the whole people. The present policy extended into the future with its eventual application to our agricultural life should result in the United States becoming a self sustaining manufacturing nation second to none. And right there is the eventual fundamental reason not for the tractor alone but for power farming with its maximum of production with a minimum of human effort.

Another factor which has its influence on the rate of agricultural production increase is the immigration rate. Prior to 1914, the population of this country was increased by more than 2 per cent per annum from this source alone. This figure is now reduced to 3 per cent of that of 1914 and materially reduces the rate of increase of the demand for farm products. The war and its excessive demands set up temporary requirements of an artificial nature and naturally stimulated the production of agricultural tractors and implements. These demands following upon a consistent rate of growth of demand very probably misled the industry into a state of over-capacity when the economic evolution of the nation and present variants from the previous trend are considered.

The history of the tractor is still brief and has been anything but a story of logical, consistent growth as it has been affected in its adolescent stage by events of a cataclysmic character. The manufacturer must face the issue squarely and make up his mind whether the present slump is a transitory affair or whether he is faced by a trend in the curve of social and economic development. If the first is the case, improvement of his sales, manufacturing and service policies will be the solution. If the second holds true, he must organize for the long haul involving new development to meet basic needs with a new type of service and sales effort.

Up to this point, underlying economic trends have been discussed. These might be called the external influences which bear on the industry. There are, however, others which lie within the industry, which are tangible and are to an extent responsible for the present condition. To begin with, the fellow who first started rating tractors in accordance with their plow capacity deserves small respect from those who have followed in his path. Many manufacturers have ceased this practice in their catalogues but still think in the same old terms. As related to the general field, this idea should have died in 1913 with the decline of the gigantic prairie plowing tractor. After fifteen or twenty years of more or less active tractor history, 80 per cent of farm operations are still handled by the common denominator of the two-horse unit. This is not a figure of speech, but an actual concrete fact. The big idea of power farming has not been put over and will not be until the manufacturer's sights are adjusted to the needs of the ordinary dirt farmer.

This is not an attempt toward the extermination of the plowing type of tractor. It has a place and a very definite place in the scheme of farming. But why should the entire industry pile on to practically one type that has not more than a 25 per cent agricultural economic field and sales appeal? What is the sense of the tractor producer of limited means entering this limited field in the face of organized, adequate competition? Both fields exist and if the needs of both are fulfilled mutual advantage in the sale of the power farming idea is eventually bound to result.

POWER farming is the justificatoin of the agricultural tractor. Until the tractor is designed so that it can be run down the road, turned into the gates of the first ordinary farm and do all of the farmer's work with the implements that are already on the place, the ideal of power farming has not been approached. Following this, the power-farming tractor must be able to perform these operations at greater speed and ease at a lower cost than they can be handled with the two-horse unit. The original investment must be comparable to that of a good two-horse team. Finally, service must be organized so that the power unit will stay on the job in a dependable fashion. This is a rather large order on the whole but it is by no means unattainable.

The farmer is not greatly concerned with the specific talking points of his prime mover. Whether it be the

horse or a tractor of one or twenty-five cylinders, plain or jewelled bearings and a plain or fancy name is nothing compared to an ability to do the specified work at the best time, and more important than any other thing, dependability. In plain words, it, either horse or tractor, must be there, ready, when the job is to be done. If this is the case, and it is, the present situation is to be understood. When the use of horses is necessary for 80 per cent of his operations why should he buy anything but a plowing tractor and that at the cheapest possible price, in the face of lowered and contracted markets? In spite of the perennial cry of labor shortage, each year's crop reports show, except in cases of voluntary limitation, substantial increases over the reports of the previous year. This statement is subject to the limitations of abnormal weather conditions, but on the average will be found true.

### Horses Do Much Work

Eighty per cent of this work even on the average tractor equipped farm is done with horses. In analyzing this statement, it must be remembered that agricultural products consist of more than wheat, oats and corn, although in most cases the production of corn falls in the 80 per cent class. There are also cotton, all the different vegetables and the fruit crops, which among many others must be included in any picture of the activities of the American farm.

The plowing type of tractor is a real asset to the farmer and, granting a better type of service, will continue to be of increasing importance in his work and therefore a source of profit to the well-organized manufacturer. Until some very remote time, the need for a number of sizes of this type will continue as wheat and some other crops can be raised with the greatest profit on a wholesale basis. On the other hand, in spite of the efforts of the Department of Agriculture in the opposite direction, the average acreage of the American farm is steadily decreasing, bringing the ultimate general market for the tractor down to smaller units.

No attempt is made here to define the design of the tractor which will command the other 80 per cent of the market. The market exists just as surely as do the sweat and long hours of the present small farmer. He will not take the output away from the first man in the field, as many of his kind have already been oversold on the present type of machine. But when the tractor which approximates the ideal of power farming, so that the farmer's attention is not distracted from the point of the tillage implement by the cumbersome operation and service worries of the prime mover, its place in the farmer's scheme of things and therefore commercial success will be assured. As implied previously in this article, the performance at the point of the tillage implement outweighs every other consideration.

There are, however, several considerations of a more or less practical nature that are the result of experience with the present type of tractor which will have a considerable bearing on the success of any power farming development. These considerations embrace practically the entire field of the tractor manufacturer, starting with design, manufacture, sales and service. Many of them may safely be said to apply to handling of the present type of tractor, as some of the precedents and policies now in effect are heritages from the farm implement industry and have already been found lacking by many of the members of that industry.

One of the big stumbling blocks encountered in the past has been the fuel problem. The farmer is not an automotive engineer and therefore bases his conception of a satisfactory fuel largely upon price. In the end he is absolutely right in his objection to the higher priced fuels. The average manufacturer has appreciated the logic of this objection but has been confronted at the same time by engineering problems that precluded adoption of anything but carbureter equipment with its limitations. There are, however, processes looming over the horizon which utilize kerosene and the heavier fuels by the injection method in comparatively simple two or four cycle installations. As price, simplicity and smooth operation are all paramount issues, the newer developments should be worthy of serious consideration.

Simplicity must govern the design of the entire tractor. Although the farmer is becoming a better mechanic, through his contact with the automobile, a reduced number of parts of simple, rugged nature can only result in fewer operating and service troubles. The advantages of this type of construction, from a manufacturing standpoint, are obvious. As the precedent for the spacing of row crops is of long standing and based upon experience, the general design of the machine must conform to the existing standards.

To sell readily, the tractor should be designed to work with the existing implements. That there is room for improvement to meet the standards of tractor speeds and performance is rather well known, but unless this phase is left on a later replacement basis, considerable sales resistance will be encountered. The stage of the specialized implement is several steps removed for the average small farmer. Until convinced of the idea of power farming or all of his horse-drawn implements have been worn out, he is a tough customer to approach with a reasonably priced tractor that requires a complete line of specialized tools. Hitches and general design must facilitate almost instant transfer from one implement to another, as a great variety of operations are involved in a day's work in making the average small farm profitable.

But little need be said from the manufacturing angle since this country is progressing rapidly along that line and the development of labor saving machinery is keeping apace. Too high shop standards cannot be maintained. The design may be extremely simple but, considering the class of service involved, production must be of a consistent high quality if complaints due to poor performance are to be avoided. There is also but little need of emphasizing the benefits which accrue to a high rate of production and organization toward that end.

### Relation of Sales and Service

Sales and service are related in that they represent the contact between the producer, the dealer and the customer. Without thorough and intelligent organization in both of these departments, the finest engineering and production efforts will be nullified and sooner or later failure will overtake the project. It might almost be said that in the past, sales effort has been overorganized and has maintained too feeble relationship with service effort which was underorganized. In fact, some observers will agree in the statement that the company which built a rather indifferent product which was well serviced has enjoyed a more lasting success than the company building a superior product with indifferent service. The farmer was apparently willing to overlook some mechanical defects if he was taken care of promptly in his time of need.

Overorganization of sales effort has been more of a collective than an individual fault. In the first place, the attempt to market twenty or thirty different makes of plowing tractor in every agricultural county seat resulted in a lot of high-powered sales methods that were necessarily unprofitable and did much to unsell the farmer on the idea of power farming. An immense number of power farming prospects have been ruined by the salesman or dealer who loaded the farmer with an absolutely

unsuitable tractor merely for the sake of outstepping competition and making a sale. The fault does not lie entirely with the dealer who has been saddled with a contract, but also with the manufacturer who made and sold just tractors instead of power farming service. For the sake of comparison, suppose that the local power company approached the manufacturer with a proposition to sell him some hundreds of feet of copper wire, a few motors and switch boxes instead of power service; what would the answer be?

### Poor Methods Cut Sales

This same fault not only had a great effect in killing the idea of power farming but also resulted in a lot of unpleasant sales methods that had some effect in destroying the reputation of the manufacturer and a marked tendency to restrict the market for even the plowing type of tractor. There was altogether too much attention given by the local salesman to the discrediting of the competitor and his product rather than to the fitting of a power service to suit the needs of the customer. When engineering sales methods instead of high pressure arguments begin to apply in power farming, not merely tractor sales effort, a more consistent, permanent success will be assured. When the dealer or salesman is equipped with a line of complete power farming service and the knowledge to apply this service intelligently to the needs of the individual farmer, the industry will take its warranted place in the American economic scheme.

With this idea in mind, it is fair to assume that the service department will eventually become more important locally than the sales department. With a comprehensive local service organization, is there any reason for the old-fashioned dealer who handled as many as four or five conflicting lines?

This question is based on an entirely different conception of service founded on a closer affiliation of the power farming service which is the commodity to be sold and the service that the manufacturer renders through his local representation. The latter service is based on the Chinese gentleman's relations to his physician, who is paid only as long as his client enjoys good health, or, in other words, a preventive service. Service, like factory inspection, is not properly an autopsy over the remains of a ruined part but is the guiding ideal or quality that enforces continued correct condition and performance.

### Better Service Needed

Tractor service in the past has consisted largely of the maintenance of a more or less—from the farmer's viewpoint generally less—complete stock of repair parts at the dealer's place of business. Sometimes a semi-skilled repair man was employed, but more often anything like intelligent service work came directly from the factory and then only after an interchange of letters or telegrams. That sort of service will never keep the farmer sold on power farming. It is much like placing a padlock on the stable after an unidentified visitor has departed with the horse.

It is, of coure, possible to lean away over backward on a service policy with disastrous results to the finances of the manufacturer. But, as a suggestion, why is it not possible to use the automotive developments of the day to combine both service and sales in a most active way which will always be one step ahead of the farmer's demands as either a prospect or an owner? In England, the selling agents for the reconditioned American trucks have already adopted the plan of placing mobile repair and service stations on the road. Standard trucks carrying stocks of repair parts and service equipment in the hands of expert mechanics make the rounds of users, forestalling trouble, making repairs and through keeping the present jobs sold they create a market for additional sales.

A rural community could be handled by one or two trained men on this basis. Show rooms with their expense would be eliminated, as the business would go to the farmer instead of waiting for him to come in. A warehouse for storage of stock and repair parts would suffice for the permanent establishment. The old type of dealer had to maintain a mechanic to approach anything like service. Why not train a keen service man into thorough knowledge of the ability of his line and its mechanical characteristics and then sell service to the farmer right on his own farm? Continued good performance has sold more tractors than all of the dealer's impassioned harangue. Those who have been long in the game know that a smart, on-the-job service man will sell as many tractors as a star salesman. He talks the farmer's language and makes good performance on one farm the stepping stone for a sale at the next place down the road.

Now suppose that this same type of man has been given a knowledge of the sales value of his power farming service and is equipped with a mobile sales and service station. It is reasonable to expect him to get over a territory of proper size in a way that will not only anticipate most of the troubles of his customers but also create a market for more of the same service. In his travels over his territory he will get into the most intimate touch with every new development. He will know in advance that Bill Jones is going to need a new cultivator when his corn begins to come up, or that Tom Smith will need a new outfit when he opens up that bottom land. He is the man that is right on the spot delivering service that is reliable, that saves a lot of hard work and money, and he will sell those tools when the market is there.

### Buying on a Cash Basis

This plan is based on the assumption that the power farming equipment and service parts are priced so that the farmer can buy on something like a cash basis. As emphasized previously, power farming service for broad general sale must be based on the price of the two-horse unit and excel the operating possibilities of that unit. Prices all along the line will have to be founded on the same basis in order to obtain the necessary ultimate broad distribution.

The same policy is capable of application to the servicing of the plowing type of tractor under present conditions. Better service will have an appreciable effect in the restoration of the tractor in the estimation of the farmer. As the farmer's demand and respect for the tractor increase, the consideration of financial interests will become more active and of tangible value. This type of service, naturally, is not capable of simultaneous national application but but could be undertaken in much the same way that the motor car industry established the flat-rate service system. This plan was first tried out and perfected in a local way and then introduced nationally.

In view of the combination of sales and service effort that is suggested, the best plan, apparently, would be the establishment of this type of effort in one small field and then gradually increasing the number of units as the good word spreads and the demand for power farming service increases. This process involves a considerable time element but, on the other hand, those who are intimate with the tractor field agree that unless some new and unforeseen contingency arises, the re-establishment of the farm tractor will be a long process. This re-establishment can probably be hastened by a broader sales appeal which will follow upon the presentation of power farming service for the small farmer at a price within his range of values.

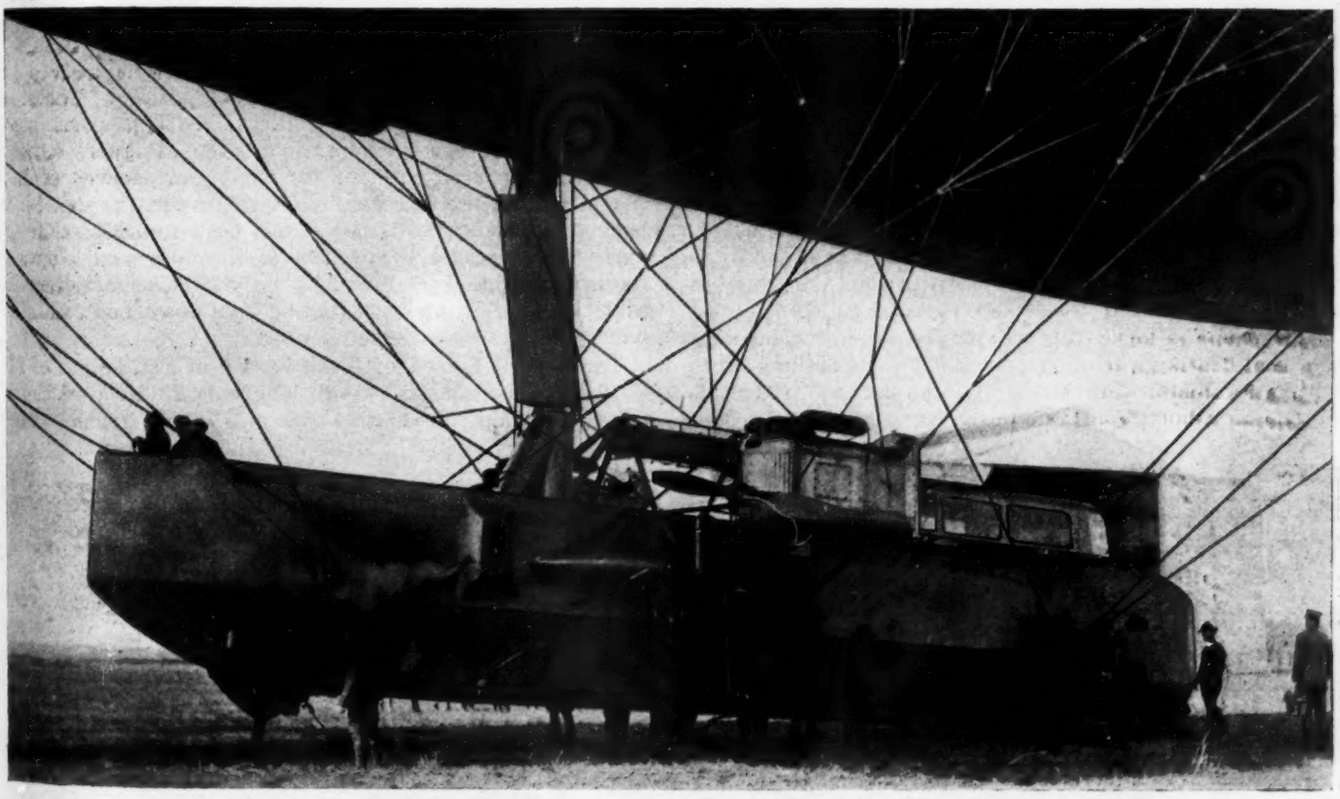
In the consideration of a price which is comparable to

the standards of the farmer, manufacturing, sales and service costs play a vital part. Reasonable costs in any of these departments cannot be attained with limited production. As broad, general distribution must be aimed at, financing, as well as the factors already mentioned, must be organized on an adequate scale. This does not mean that the limited company is eliminated from the picture. The market for the various sizes of plowing tractor and other specialized purpose machines will continue to exist and grow until the country enters another economic era of an entirely different nature. It does mean, however, that the limited manufacturer must know his field and its limitations in the most thorough way. He must also be a keen analyst of his future market. In addition, he must manufacture, sell and service at a minimum expense and finally seek individuality of design and function that will take his product out of competitive fields of a different price range.

A moral may be drawn from the recent discussion of the car market which appeared in the columns of AUTOMOTIVE INDUSTRIES. The percentage of cars manufactured and sold by the smaller manufacturers has varied but little in spite of the tremendous expansion of the industry. The companies which have entered and disappeared from this classification are legion and the only names that remain year after year are those whose product makes a definite appeal to a definite specialized portion of the market. These are the companies that have made and sold their product with a definite idea of the limitations and characteristics of their market. Unsound competition has found no lasting existence in this field.

The small, isolated tractor company which endeavors to compete in the plowing or other specialized field of purely tractor effort in the face of highly organized competition will have small chance of remaining in the market. The only solution seems to be in amalgamation and centralization of effort from the engineering department on through manufacturing, sales and service. After that point has been reached, organization for the long haul of selling the idea of power farming will go far in winning the confidence of the American farmer and his banker adviser.

# Largest Non-Rigid Airship Completed



*Airships, Inc., of Hammondsport, N. Y., have just completed at their plant, and delivered to the U. S. Air Service, the RN-1, largest non-rigid airship in America.*

*The ship which is a reconnaissance ship will be stationed at Scott Field, Belleville, Ill., in the second largest hangar in the country, the largest being at Lakehurst, N. J., where the U. S. Navy is erecting ZR-1.*

*The RN-1 has a hydrogen or helium capacity of 325,000 cu. ft., giving the ship a lifting capacity of 21,000 lb., and a ceiling of 10,000 ft. The weight of the hull is 6500 lb. and the weight of the car, engines and useful load amounts to 14,500 lb.*

*The envelope has a length of 262 ft. and a beam of 48 ft. The height overall is 70 ft. and the length of the car is 55 ft. The ship is powered with two 400 h.p. Liberty engines and an auxiliary blower motor, giving her a speed of 60 m.p.h. She is equipped with bomb races and a machine gun and carries a crew of 12 men.*

*From the car a gun tunnel goes directly through the ship, allowing members of the crew to climb to a gun platform on top, on which is placed a machine gun. The upper platform will accommodate a gunner and two observers.*

*The envelope is made of a special three-ply rubberized balloon fabric with an outer coating of aluminum.*

*Official photo U. S. Air Service.*

# Yellow Coach Has New Bus Chassis with Single or Two-Deck Bodies

**To be built for Chicago Coach Co. and also for general market. Four-wheel brakes, 4 x 6 in. Knight engine, three-speed chain or four-speed gear type gearset, underslung worm axle, progressive springs with rubber shock insulators among important features.**

By J. Edward Schipper

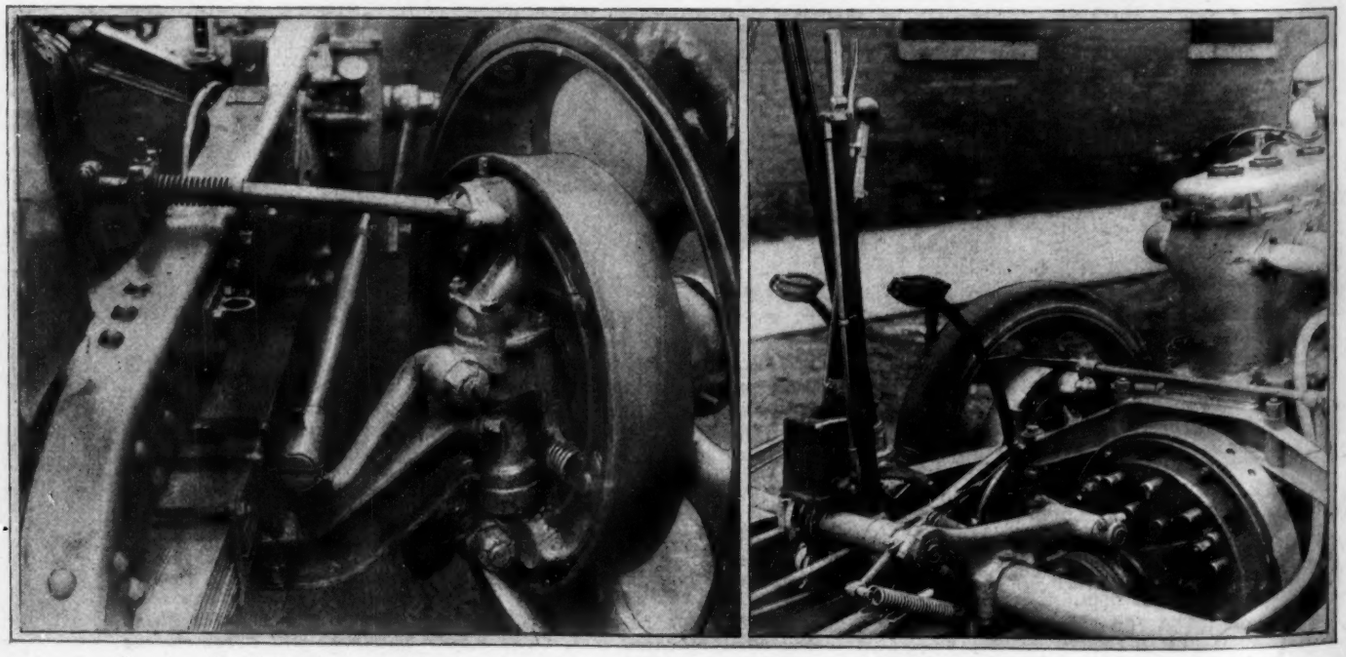
A NEW bus designed to carry either a 67 or 57-passenger, double-deck body for two-man operation or 29-passenger, single-deck body for one man operation, has been brought out by the Yellow Coach Mfg. Co. The 67-passenger body has been designed under the direction of George A. Green, with Chicago service particularly in mind. The Yellow Coach Mfg. Co. makes buses for operation by the Chicago Coach Co. in a plant adjacent to the Yellow Cab plant, but the models referred to and other models to be announced later will also be placed on the open market.

The new chassis, known as model Z, is provided with four-wheel brakes, a four-cylinder 4x6 in. Knight engine with 5 to 1 compression ratio and credited with exceptionally high torque and power output, progressive springs fitted with rubber shock insulators and other features of unusual interest. The frame, which is only 23½ in. from the ground, is designed for great rigidity in order to relieve the body of unnecessary distortion and thus increase its life and decrease upkeep cost.

The frame is kicked up over the rear axle, which is of the semi-floating variety employing an underslung worm with a duralumin worm wheel giving a 6.25 to 1 reduction. A reverse Elliott front axle designed to give center point steering and to carry the front wheel brakes is employed. Special provisions for rendering the steering as easy as possible are incorporated in this design.

A notable feature of the new chassis is the rigidity of the frame. It has been designed purposely to protect the body from all stresses due to road shocks. Five tubular cross-members with the ends brazed into steel castings riveted to the side bars are employed. Two of these cross-members are 2½ in. in diameter, one is 3 in. and two are 4½ in. In addition, there is a stiffening member, at the rear end of the rear spring, which is secured in place by means of exceptionally wide gussets. The side rails are 10 in. deep and ¼ in. thick. This frame construction is rather unconventional, the designers having done the utmost to render the body independent of the chassis, and while the chassis, for this reason, is somewhat heavier, according to Green it has been found possible to materially decrease the weight of the body and lengthen its life. Another claim made by the coach company is that the rigid frame construction cuts down body maintenance charges to a marked degree.

The new 67-passenger coach has an overall length of 27 ft. 6 in. The chassis overall length is 23 ft. 7 in. from the starting handle to the rear end of the frame. The

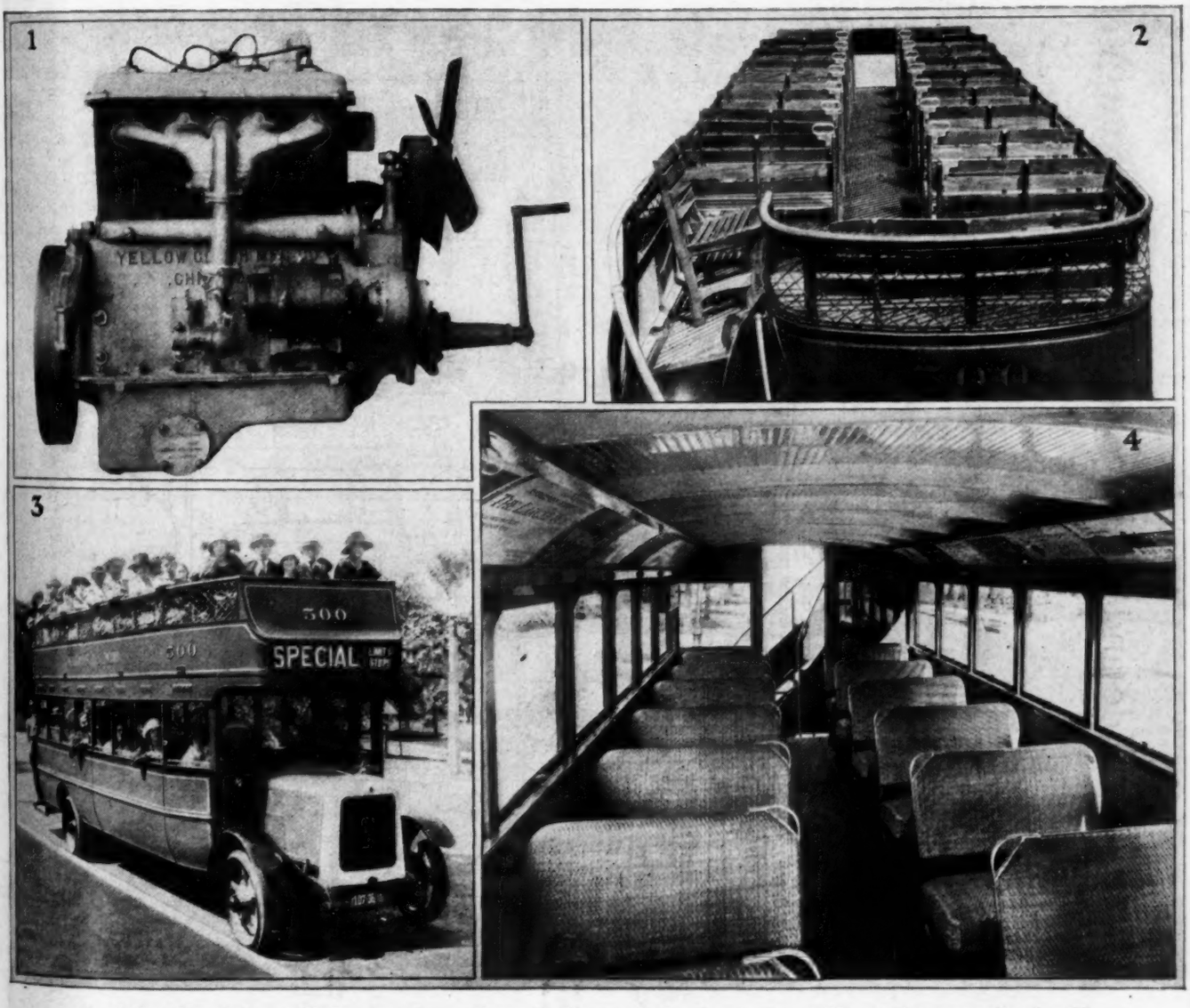


*Front axle with control mechanism front wheel brakes, mounted on tubular cross member of frame, the latter an optional feature*

weight of the vehicle complete is approximately 6784 lb. The wheelbase is 16 ft., the overall width 7 ft. 10 in. and the turning radius 34 ft. The height of frame from the ground is 23½ in.

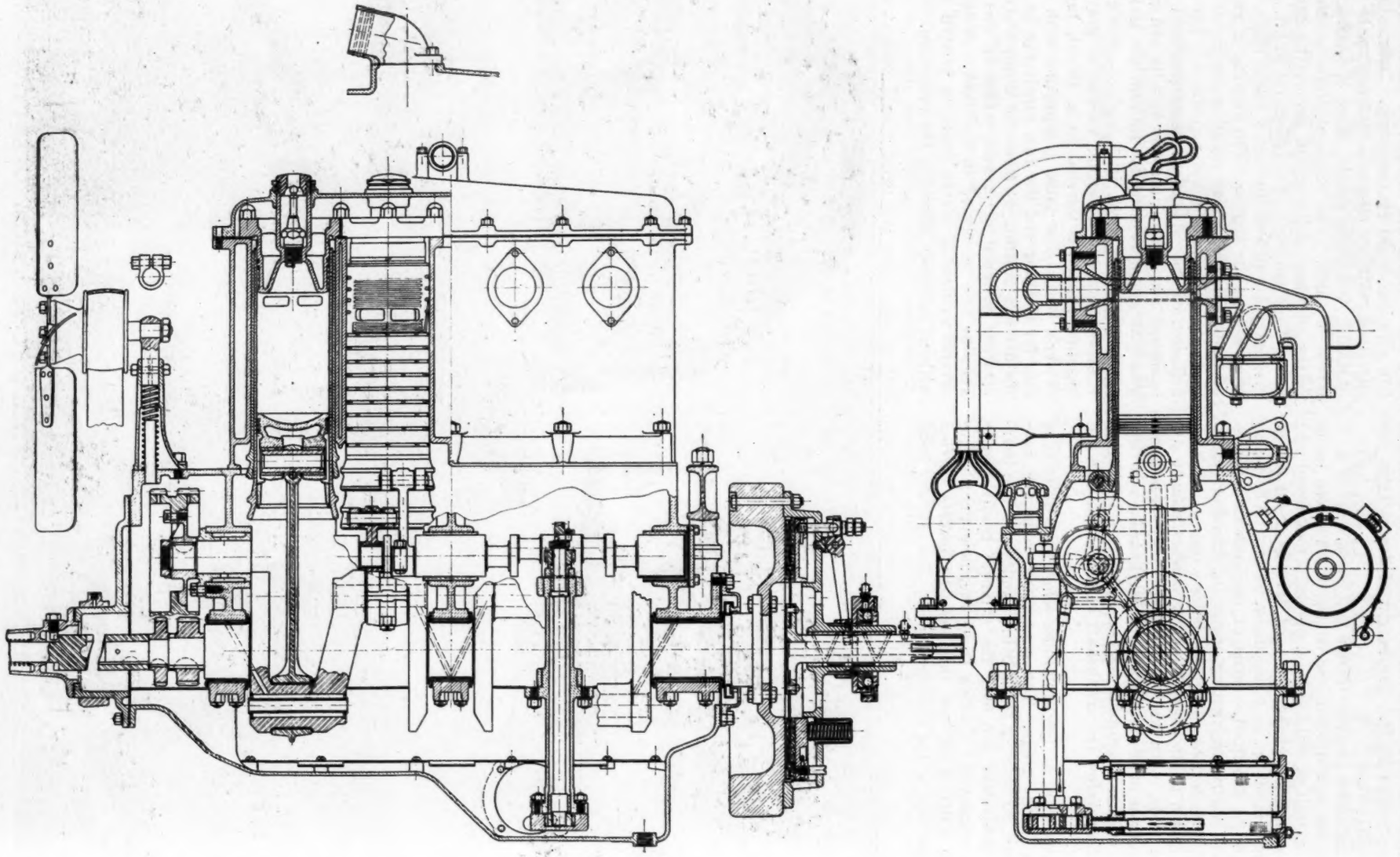
As in the other Yellow Coach Co. buses, the R & V Knight engine is employed, the engine in this case being a 4 by 6 in. unit of 301.5 cu. in. piston displacement and with a compression ratio of 5 to 1 developing 40 hp. at 1400 r.p.m. and 60 hp. as a maximum output. The maximum torque is 225 lb.-ft. Some of the outstanding features of the engine are the use of a 3 in. diameter crankshaft with drop-forged, integral balance weights and force feed lubrication to the main bearings, eccentric shaft and connecting rods, with an oil strainer easily detachable from the outside of the crankcase. The crankcase is a two-piece unit of cast aluminum, webbed to prevent distortion and split 2 in. below the crankshaft center line, as an aid to rigidity.

The pistons are of the aluminum alloy, split skirt type with four ⅛-in. rings. The connecting rods are babbitted direct, no bearing shells being employed. The bearings are grooveless and only the thinnest possible gage shims are employed. Cooling is by thermo-syphon circulation, the walls being cast thin and the jackets carried down to the base of the cylinder block. The cylinder head and water cover are readily detachable and the cylinder and sleeve ports are bridged to insure maximum sleeve life with consistent fuel economy. Lubrication is by pressure feed, with the oil pump attached to the crankcase top half and positively driven from a helical gear on the eccentric shaft. The pump projects to the lowest point in the oil sump and a splash plate is located immediately above the strainer. The eccentric shaft, magneto and generator are driven through a silent chain located at the front end of the engine. The housing is an integral part of the crankcase, which construction is claimed to eliminate vibration and increase stiffness. The carbureter is a Zenith of special design, being provided with a ½-in. hardened and ground throttle spindle and large carrying area. A gland is fitted to prevent air leakage. A hot-spot manifold is used, with a short, straight inlet pipe. Provision is made for either vacuum or gravity feed. The gasoline supply is carried in a 43-gal. tank under the driver's seat. The tank is equipped with a large hand hole for cleaning and the fuel supply can be shut off from the driver's position by means of a quick acting valve. A strainer designed to prevent water or dirt entering the gasoline line is located in the tank. It is claimed that several gallons of water could be poured into the tank without seriously affecting the operation.



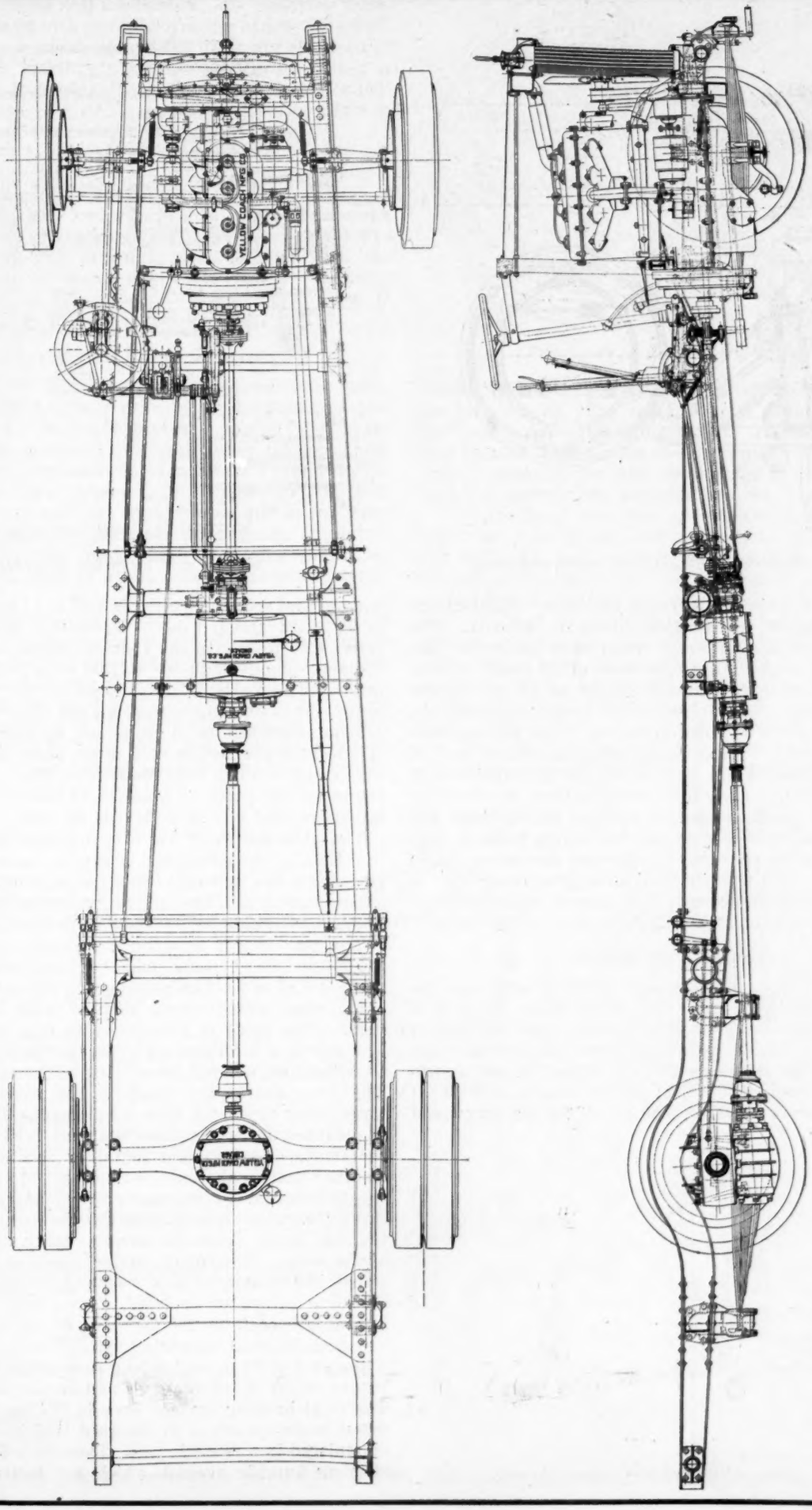

*1—Inlet side of four-cylinder 4 x 6-in. engine. 2—Upper deck of new bus with seating capacity for 38. 3—New 67-passenger double-deck, two-man bus. 4—Lower deck of new bus carrying 29 people*

# Side and End Section Views of New Yellow Coach Engine

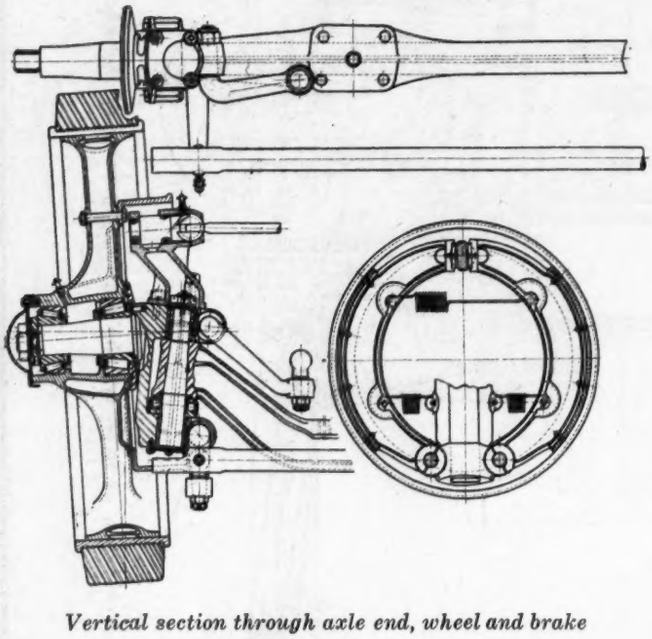


*This engine is of the Knight sleeve valve type with four 4 x 6-in. cylinders. It operates at a compression ratio of 5 to 1 and is claimed to give 40 hp. at 1400 r.p.m.*

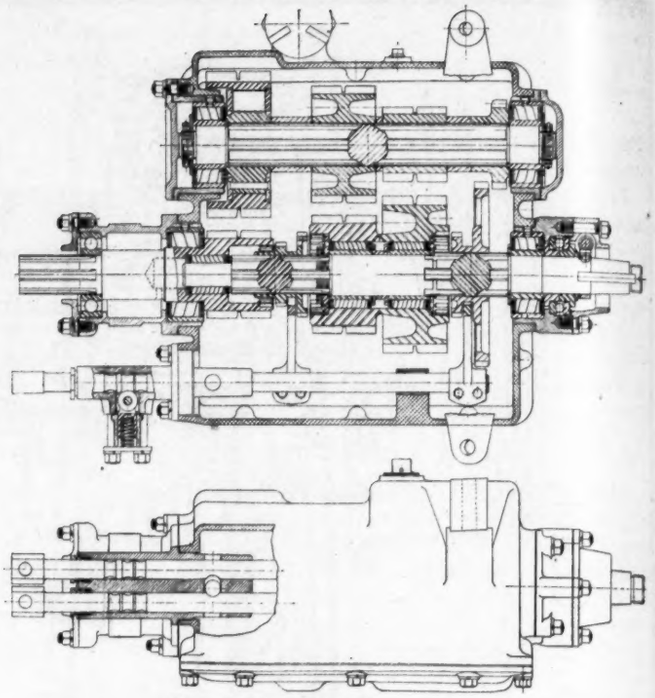
# Chassis Construction of New Yellow Coach



*The elevation clearly brings out the lowness of the power plant, a very desirable feature in double-deck buses, as it lowers the center of gravity of the whole vehicle and increases its stability*



*Vertical section through axle end, wheel and brake*

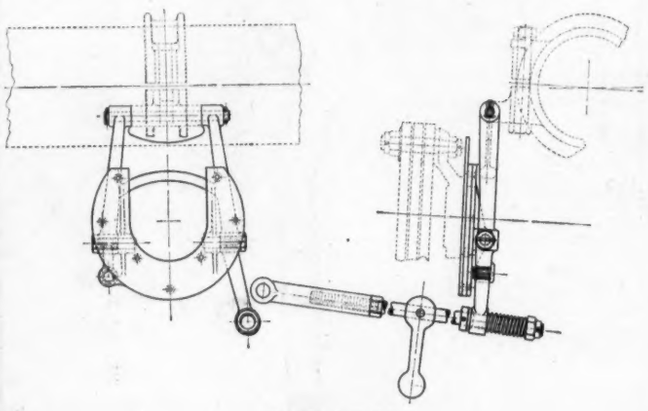


*Section and elevation of gearset*

The clutch is a single plate type with a very light driven member to which the friction lining is secured. The spring pressure is distributed evenly over the entire surface of the friction lining by means of 20 small springs in cups. The driven member is cooled by an air current entering through holes drilled in the front cover near the center. The air is expelled from the cored passageways at the outer edge of the clutch cover, giving a sort of sirocco fan effect. The location of the passageways in the clutch cover is such that through them the friction lining can be readily inspected without taking down the clutch. A simple adjustable external clutch brake is provided. The clutch throwout is operated through a toggle arranged in such a manner that while great resistance is opposed to clutch engagement it is easy to hold the clutch out of engagement after the toggle is once thrown over.

## Two Gearset Models

One of two types of gearset is supplied with the bus chassis, a three-speed unit with silent chain drive or a four-speed unit with gear drive. Both types of gearset are mounted amidship with three point suspension. The reductions in the three-speed silent chain box are as follows: First speed, 3.39 to 1; second speed, 1.65 to 1; third speed, direct; reverse, 3.56 to 1. On the four-speed box the first speed reduction is 5.35 to 1; second speed, 2.84 to 1; third speed, 1.54 to 1; fourth speed, direct; reverse, 6.30 to 1. On the four-speed box the shifter lever contacts directly with the shifted dogs instead of through intermediate parts. To facilitate service on these gearboxes, the covers are located on the under side, thus permitting workmen in a pit to get at them readily. The silent chain gearbox is very much along the lines of that used in the London omnibus service, where they have been employed for years on account of the rigid police regulations in that city with regard to noise.



*Clutch brake*

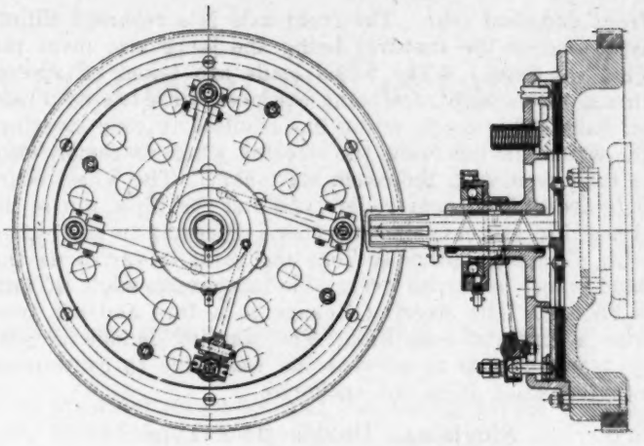
The propeller shaft has a center-to-center length of 68 in. It is so designed that it can be taken down and replaced in a few moments, there being no interference from other members. The entire transmission unit can be dropped by taking out two cap screws and two bolts.

The rear axle is an underslung worm and wheel type, the worm wheel being made of duralumin. The gear ratio is 6.25 to 1. The housing is a one-piece, drop-forged banjo type, heat treated member with integral spring pads. This piece is gun-drilled to take the axle shafts. The axle is a semi-floating type, permitting the wheels to be withdrawn without interfering with any wearing parts. The drive shafts are tubular. The bearings are all of taper roller type with shim adjustment. Each rear wheel is mounted on two opposed bearings held in a container, the shafts, bearings and container thus forming a unit. Another unit in the axle is composed of the carrier with the differential worm, worm wheel and bearings. The carrier rests completely against the banjo member and the side thrust from the worm is taken against the bore of the banjo. The entire carrier, together with the worm, wheel and bearings is a bench assembly and may be quickly removed or replaced.

Brakes operate on all four wheels and are of the cam-operated, internal expanding type. The rear brakes have a diameter of 21 in. and a 5-in. face width, while the front brakes are 18 in. in diameter and have a 5-in. face width. The total braking surface area is 774 sq. in. The front wheel brake system is so designed that it can be removed or replaced in a few minutes. There is a flange above the steering knuckle against which are bolted the brackets

supporting the brake cam mechanism. By removing these bolts, the brackets with the cam housing can be detached. The anchorage for the shoes and the drum are also readily removable, thus making it possible to provide either a two-wheel or a four-wheel brake installation, as desired. The buses which will be in operation on the Chicago streets will be of the four-wheel type, however.

Both the rear and front wheel brakes are readily adjustable by the driver from his seat. A hinged plate is located in the floorboards and when this plate is lifted it renders the adjusting levers accessible. These levers can be operated without tools. The brake cross-shafts are mounted in spherical bearings, and in order that the stresses on the two rear cross-shafts and the resulting deflection may be minimized, a connecting linkage is employed tieing these cross-shafts together.



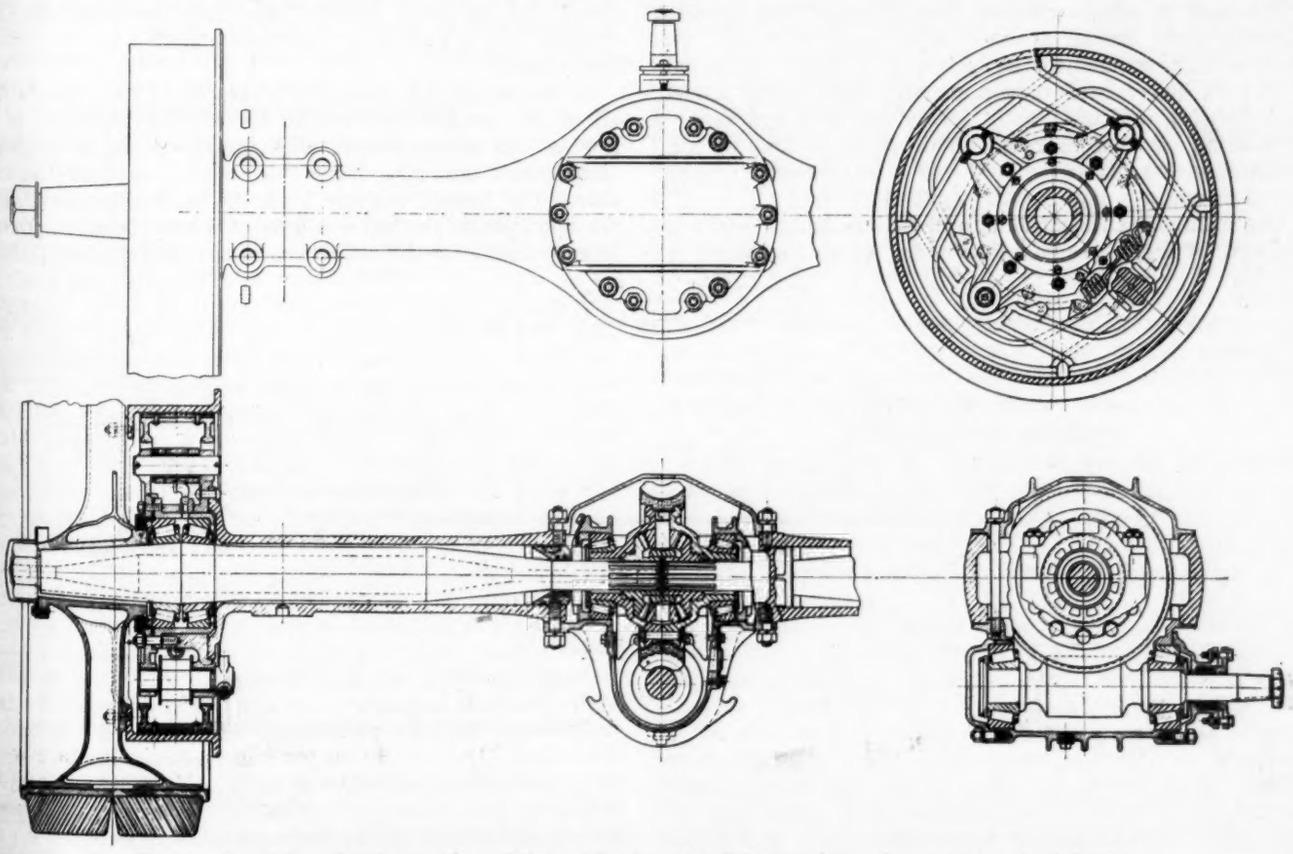
*Two views of the single plate clutch*

## Four-Wheel Brake Design

Referring to the diagram of the four-wheel brake mechanism, depression of the service pedal *A* operates a pull rod *B* connected with a banjo lever *C* on the front brake cross-shaft. By means of the banjo lever the motion of the brake pedal is transmitted to pull rods *D* for both the front and rear wheel brakes. The lengths of the lever arms for the front and rear wheel brakes are proportioned so that the leverage for the rear wheel brake is slightly greater than for the front wheel. Serrated joints are used in place of keys as connecting means to the cross-shafts.

There are alternative positions for the brake pull rod pin center on the banjo lever, so that the leverage on the front wheel brakes can be altered at will. This, in connection with the fact that the rear wheel brakes are 3 in. greater in diameter than the front wheel, is claimed to obviate the possibility of the front wheel brakes becoming more effective than the rear wheel and of the front wheels locking while the rear wheels are still rotating. An independent set of brakes operated by the hand lever acts on the rear wheels. The hand lever is pushed in applying the brakes, instead of being pulled. The brake drums are heat treated, high carbon steel forgings. There are labyrinth grooves in the dust cover fitted to the front wheel brakes to prevent the entrance of dust.

Both the front and rear springs are of the progressive type; the rear springs are underslung beneath the axle and both sets are mounted underneath the frame. The flexibility increases from 700 lb. per inch deflection under normal load to 1400 lb. per inch deflection under maximum load. Rubber shock insulators are employed in place of shackles and shackle pins. Both the drive and torque are taken through the rear springs, which are 62⅝ in. long and 4 in. wide. Large spring clips (1-in. bolt size) are used. The front springs are 50½ in. long and 3½ in. wide. The wheels are of cast steel with hollow spokes and rims, and have outside dust covers cast on. The tires are 34 by 5 in. solid, or 34 by 6 in. semi-pneumatic, single



*Rear axle with underslung worm drive and two sets of internal, quadrant type wheel brakes*

front and dual rear. The front axle is a reversed Elliott type, one of the features being the large size pivot pin (1¾ in. diam.). The wheel loads are taken on special thrust races, each race being equipped with twenty 11/16 in. balls. This construction has resulted in easy steering, the writer having found the steering wheel extremely easy to turn even with the coach stationary. The wheel bearings are of the taper roller type and the pivot pin is inclined for center point steering. Steering is by worm with a variable pitch so that the ratio is varied as the hand wheel is turned over. The maximum angle of lock is 33 deg. The steering linkage is a fore and aft type with a straight drag link. The starting handle is held by a spring stop to prevent the wear due to continuous swaying when it is not anchored.

### Single and Double Deck Types

The 67-passenger, double deck body provided on the Chicago buses seats 39 passengers on the upper deck and 28 passengers below. The seats are so arranged that all passengers face forward. The distance from the dash to the rear of the body is 19 ft. 7½ in., and the overall length of the complete vehicle is 27 ft. 6 in. The platform is 45 in. long. The upper deck is 23 ft. 6½ in. long and the overall width of the body is 7 ft. 10 in. A feature of the construction of the body is that all the seats line up with the body pillars, thus giving the passengers unobstructed vision. A very narrow front pillar is used so as not to interfere with the driver's vision. The center aisle width is 18 in.

The wood of the body frame is second growth hickory, the joints being treated with white lead and either screwed or bolted. The lower deck and stairway panels are of sheet steel; these are given a rust-preventive coat, and the panels are screwed and the edges covered with metal or wood moldings screwed through the panels into the framework. The upper deck panels are of ¼-in. Haskelite, applied so that no edges are exposed to the weather.

The roof is constructed of 2-in. tongued and grooved selected pine, braced at each body post with ash gun stock carlings braced to the body posts. The roof is covered with heavy, waterproof canvas, maple slats, closely spaced, being laid diagonally across the roof and secured in position by brass screws. This construction, in combination with a cambered roof and a marine type scupper drain, provides a rigid, watertight structure.

The usual broad sash employed in bus bodies has been replaced by light drawn brass sash, which increases the window vision and decreases the weight. This also facilitates replacement of glass, since it is only necessary to take out four screws to disassemble the sash.

### Interior Illumination

Illumination of the interior is accomplished by eight 21 cp. nitrogen lamps so arranged that the light is thrown directly over the sets. The lights are self-contained in the upper half of the advertising rack and are removable as a unit. The rear platform is illuminated by a light over the entrance step, and the front and rear destination signs are also illuminated. A 300-watt generator mounted on the engine supplies the current.

The driver is inclosed in a separate compartment with an independent entrance through a 27-in. door on the left side of the coach. All sides of the cab are of glass, with a ventilating front and dropping glass in the side door. The glass at the driver's right can be slid back to provide clearer vision when necessary. The driver is at no time in contact with the passengers. The customary bell system is installed. Each seat on both the upper and lower decks is provided with a buzzer button connecting with both driver and conductor, and there are conductor's signal bells on both the upper and lower decks. The stairway is a spiral type, 17 in. wide, with 8 steps having a 10-in. rise.

### Step Construction

The steps are made of ⅞-in. ash, covered with safety tread and provided with guard panels and polished white metal hand rails on both sides. All edges are rounded and molded so that there is nothing projecting to catch or tear clothing. Ventilation of the body is effected by a louvre type ventilator with sliding adjustment. The louvre ventilators are individually operated. There are 14 of these and they are capable of renewing the air within the coach every 10 min.

The painting scheme on the standard buses is brilliant green for the body panels, black for the moldings, and chrome yellow with ¼-in. gold leaf striping for the chassis and wheels.

It will be noticed from the elevation of the chassis that all of the mechanism back of the control members is below the top of the frame, with the exception of the brake shafts, and that the frame has a kick-up over the rear axle. The former feature tends to facilitate mounting of the body, while the latter allows of a low center of gravity. The straight-line drive feature is also clearly brought out.

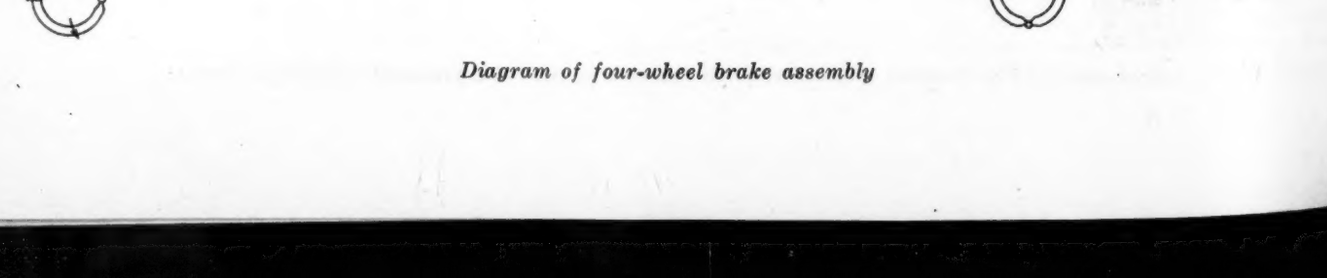



*Diagram of four-wheel brake assembly*

# Output of Over 3,000,000 Seems Certain for 1923

***Midsummer decline smaller than expected. Due largely to slowing up of factories for model changes. Dealers still unable to meet demand for closed cars. Production figures are analyzed.***

MIDSUMMER has brought a decline in motor vehicle production but there has been nothing about it which has resembled a slump. Sales have not fallen off to as great a degree as manufacturers and dealers expected. Sales organizations, as a consequence, are in no sense dubious about the outlook for the coming months. There still is an actual shortage of closed models and few dealers are seriously overstocked with open cars.

July was the fifth successive month to show an output in excess of 300,000. The total for that period was 1,824,365, which was 163,000 in excess of the total for 1921. It was only 150,000 less than the total for 1919 and 45,000 less than for the full year of 1917. It exceeded by a substantial number every other year in the history of the industry with the exception of 1920 and 1922.

The first seven months of the year gave an aggregate production of 2,344,000 cars and trucks. This is only 315,000 behind the total for the 12 months of 1922. This means that an average of only 63,000 a month need be built the remainder of 1923 to equal the new record established last year. No such shrinkage in business is possible and 1923 is certain, therefore, to set another mark to be shot at in the future. The smallest monthly output since July, 1921, was 79,000 in December of that year.

### Average Production Total

The average monthly production for the first seven months of 1923 has been 260,623. On that basis the next five months would give an additional 1,303,000, making 3,127,000 the total for the year. The actual output for the last five months of 1922 was 1,181,000 and in the same period in 1921 it was 682,000.

Output in the final five months of 1921 was 40.9 per cent of the year's total and in 1922 it was 44 per cent. The average for the two years, therefore, was 42.45 per cent. If the same average holds for 1923, the year's total will be 3,172,000 or 1,348,000 for the five months. This would necessitate a monthly average of about 269,000 which is only 9,000 more than the monthly average maintained thus far. January, with 243,000, has been the only month which has fallen below that figure. February was 7,000 above it and March leaped to 354,000.

July, with 318,000, was 49,000 above this hypothetical average although it was 75,000 below the peak for the year, which was 393,000 in May. Last month showed a drop of 58,000 from June while July last year showed a loss of 43,000 as compared with the preceding month. If the history of 1922 should be repeated August would be better than July, and September smaller than either of the preceding months.

The industry has been frankly amazed at the sustained demand for its products. The volume of July business far exceeded what was expected at the end of the second quarter and the August outlook is encouraging. It is now practically certain that the year's output will exceed 3,000,000. The chief point in doubt is how great the excess will be. It does not seem probable, however, that it will run far beyond the indicated total of 3,172,000.

Assuming that truck production will continue to be about 10 per cent of the total, as it has been thus far, the 1923 output of commercial vehicles would be 317,000, leaving 2,855,000 passenger cars. The record for trucks was established in 1920, with 322,000. The next best mark was in 1919, with 316,000.

In the calendar year ending with July the industry turned out 3,525,000 motor vehicles, and in the eighteen months ending with July it made 4,781,000, which was only 83,000 less than the combined total of the two biggest previous years in history—1920 and 1922.

Additional evidence has been provided by the present summer that there is no such thing as a drastic "seasonal decline." Much of the falling off in production last month was due to the fact that several important companies were getting ready to go into production on new models. Their factories were slowed up of necessity. If the output thus lost were added to the 318,000 actually turned out it is doubtful if the figures would have been materially under June.

Production has not been at any time this year seriously in excess of sales. City dealers have experienced some slackening of demand in the past six weeks, but this is explained by the fact that many thousands of city dwellers flock to the country on their vacations in July and August and they naturally do not buy cars while away from home.

Thus far the industry has proceeded cautiously, testing out demand, and it will be wise if it continues to do so. There undoubtedly will be good business the remainder of the year, but it cannot be gaged accurately until the vacation season is over and until farm crops are harvested. The size of the farm market cannot be forecast definitely at this time and city sales will depend somewhat on the prices the farmer gets.

### Demand Is Stable

Every passenger car manufacturer can be assured, however, that the country will absorb all the closed cars he can turn out and a substantial number of open models. Dealers generally still are behind in deliveries of closed cars and there are no indications that they will be able to catch up.

No substantial evidence is to be found of any real shrinkage in the purchasing power of the country, except in some farm districts which have not been buying heavily anyway. There can be no question about the permanency of the market for motor cars. There have been many thousands of first buyers this year, especially in the lower priced classes, and once a family has owned an automobile it is not likely to go without one if there is any way of avoiding it. The replacement market becomes larger and more stable each year.

# Advantages of Transmission Brakes Outweigh Disadvantages

## Part II

**Certain valid objections have been raised to this type, but some weaknesses are fancied rather than real. Difficult to calculate accurately strains on transmission members. Braking effect is always equally divided between right and left wheels.**

By P. M. Heldt

GENERALLY speaking, the most powerful brake is one acting on a shaft running at a higher speed than the wheels through which retardation is effected. Such a brake has the further advantage that it can be operated with much less physical effort than a brake acting directly on the wheels. The transmission brake, which is of this type, is found on relatively few American models, while almost all European cars are equipped with it. There is an extremely wide variation of detail in the elaboration of these brakes. The cheaper cars carrying them usually have band brakes of rather simple design, while some of the high grade European cars use internal transmission brakes of considerable size and with provisions for rapidly carrying off the heat generated.

Like every other mechanism, the transmission brake possesses some real disadvantages, but in addition to these, objections often have been raised against it which have no foundation in fact. As the retarding effect depends upon the adherence between the tires and the ground, the retarding force must be transmitted from the surface of the brake drum, where it originates, to the circumference of the road wheel, and the conclusion seems logical that the closer the brake drum and the wheel surface are brought together the less will be the chance of failure. The force of this argument is greatly reduced, however, by the fact that in connection with a brake on the transmission there is always provided another acting directly on the rear wheels, so that even if the transmission brake should fail, that would not render the driver helpless. So far as the brake itself and its operating mechanism are concerned, it is probably fully as dependable if located on the transmission as if located on the road wheels, and it is only the possibility of a failure of one of the intermediary parts that transmit the braking force, including the propeller shaft, universal joints, final drive gear, differential gear and axle shafts, that constitutes an additional—and in a properly designed car a very small—hazard, against which the provision of one set of wheel brakes would seem to afford sufficient insurance.

### Tranmission Members Strained

The objection has been raised against the transmission brake that it subjects the transmission members enumerated in the preceding paragraph to undue strains. What may be the absolute limit of the retarding torque which can be impressed upon these members is somewhat difficult to calculate with any degree of accuracy, as it depends to a certain extent upon the moments of inertia of these parts and the speed with which the braking effort is applied, but there is no reason for believing that this exceeds the maximum driving power that can be transmitted through these parts. Making exception of the instantaneous loads determined by the inertia, the maximum loads due to both braking and driving are limited by the ground adherence of the wheels.

### Possible to Slip Wheels

It is generally possible to slip the wheels both by means of the brakes and by means of the engine when driving through low gear. These represent the cases of extreme stress on the transmission in braking and driving respectively. But with the same road surface, slipping of the wheels under engine power represents a considerably greater wheel torque, and hence greater strain on the transmission members, than slipping under braking action. This is due to the fact that, as was shown in the foregoing, application of the brakes reduces the reaction between the wheels and the ground, by about 12 per cent when the wheels are being slipped, whereas application of a driving force producing wheel slippage increases this reaction in about equal proportion. We may therefore say that the adhesion between the wheels and the ground is roughly 25 per cent greater when the wheels slip in driving than when they slip in braking. The conclusion to be drawn is that the maximum stresses to which the transmission parts can be subjected in driving are far greater than the maximum stresses due to braking, and this argument against the transmission brake falls to the ground.

Recently another objection to the transmission brake has been discovered, and that is that its application often leads to a sudden reversal of torque, and, therefore, of torque reaction, which tends to unfavorably affect the stability of the car. In the great majority of the cars the engines turn right-handedly, looked at from the front, and the right hand torque or turning effort of the crankshaft is balanced by an equal left-hand turning effort on the engine frame or chassis, which results in transferring weight from the springs on the left side of the car (looked at from the rear) to those on the right side. This effect of torque reaction is well known to designers, and formerly, when most cars still had right-hand drive, so that whenever a car was occupied by the driver only, the right side springs were additionally loaded, many provided against a sideward tipping action of the frame by making the springs on the right, or at least the right front spring, stiffer than the springs on the left.

When the transmission brake is applied the torque on the propeller shaft is reversed, and so is the torque re-

action, which is transferred to the frame through the brake anchorage. Consequently, the springs on the left side of the car are then more highly loaded, and if there is a sudden change from a full driving torque to a full braking torque, there will be a rocking effect on the chassis and a corresponding shifting of weight or ground reaction from the right to the left wheels. It should be of interest to investigate this effect somewhat further, with the aid of figures corresponding to a practical case. A case is hardly imaginable where it becomes necessary to suddenly apply the brakes to the locking point when proceeding on the low gear under full power, and we will assume that the brakes are applied while the car is proceeding under full power on high gear. Let us take a moderate sized car with an engine capable of developing a torque of 175 lb.-ft. Let the car with passengers weigh 4000 lb., let the wheels be 32 in. in diameter and the final drive gear ratio, 4 to 1. Then, assuming again that the weight on the rear wheels while at rest is 60 per cent of the total, that there is a transfer of weight of 12 per cent and that the adherence coefficient is 0.6, the force necessary to slip the rear wheels by the brakes is

$$4000 \times \frac{60}{100} \times \frac{88}{100} \times 0.6 = 1264 \text{ lb.}$$

This force acts on a lever arm 16 in. long, producing a torque of 20,200 lb.-in. on the rear axle shafts, and one-fourth of this, or 5050 lb.-in., = 420 lb.-ft. on the propeller shaft. Therefore, when the transmission brake is suddenly applied to the locking point after the car has been running under full power on high gear, there is a sudden reversal of torque reaction on the frame from — 175 ft.-lb. to + 420 ft.-lb. This torque reaction, of course, asserts itself in a change in the distribution of spring loads and of wheel-ground reaction between the right and left sides. The tread being 56 in., or 4 2/3 ft., the removal of weight from the right side wheels when the driving force is withdrawn is

$$\frac{175}{4.66} = 37.5 \text{ lb.}$$

and when the transmission brake is applied

$$\frac{420}{4.66} = 90 \text{ lb.}$$

which makes a total transfer of ground reaction of

$$37.5 + 90 = 127.5 \text{ lb.}$$

from the right to the left wheels.

The effect is substantially the same as if a rather heavy passenger suddenly slid from the right to the left side of the rear seat, and it is obvious that this does not involve any danger to the stability of the car unless other conditions already have brought it close to the upsetting point.

### Braking Effect Divided

One thing that distinguishes the transmission brake from equalized brakes acting on drums on the road wheels is that in the case of the former the braking effect is equally divided between the right and left wheels, whereas in the case of the latter only the pull with which the brakes are applied is equalized. With the transmission brake acting through the ordinary differential gear it is impossible to exert a greater braking torque through any wheel than the torque required to slip the wheel with the least ground adherence. If the braking torque is greater than twice this slipping torque, the wheel with the smaller adherence will be set into reverse rotation without increase in the total braking effect, unless spinning of wheel happens to change the coefficient of ground adherence.

### Advantages Compared

With the ordinary type of equalized wheel brake the limited braking effect of either wheel is independent of the ground contact conditions of the other wheel. The latter type of brake, therefore, is capable of exerting a greater maximum braking effort where the road surface condition is non-uniform. This might be considered an advantage of the rear wheel brake over the transmission brake, but, unfortunately, the application of the rear wheel brakes under such conditions, to the point of locking one wheel, has a decided tendency to produce a skid. In running down a grade, if the wheels on one side are on hard, dry surface and those on the other side on sandy or gravelly surface, which has a much lower coefficient of adherence, a powerful application of rear wheel brakes practically always causes the car to skid, while the transmission brake has no such effect. As soon as the car begins to skid the driver is inclined to loosen the brakes to stop the skid, and the theoretical excess of braking power of the rear wheel brakes over the transmission brake, which exists only for the case where the ground adherence is unequal for the two road wheels through which the brakes act, can rarely be realized in practical driving.

**THIS is the second of a series of four articles discussing various phases of brake design. The first, entitled "Proper Study of Weight Distribution Essential to Correct Brake Design," appeared in the issue of Aug. 9. The third article will deal with four-wheel brakes.**

The one great advantage of the transmission brake is that it requires much less operating effort for a given braking effect. If the drum of the transmission brake were of the same diameter as the drums on the rear wheels, with the same linkage and pedal length, the pedal pressure required by the wheel brakes would be greater than that required by the transmission brake in the proportion of the rear axle reduction ratio. Ordinarily, of course, the transmission brake drum is little more than half the diameter of the drums on the rear wheels, but with a gear ratio of 4 to 1 and greater, the advantage is still greatly in favor of the transmission brake. For equal braking effect, the pedal pressure required by the transmission brake is less than 50 per cent that required by the rear wheel brakes. This is especially important in the case of heavy, powerful cars, for the reason that the practical range of pedal motion is limited by the human anatomy, and with an increase in the weight to be brought to a stop the pedal pressure must be increased. Even in small cars the full application of the brakes is an onerous task to persons of no great physical strength, and that the great effort required for the braking of heavy cars is considered a serious disadvantage is attested by the activity which is being developed in Europe in connection with the development of servo brakes. A car of moderate size and speed that is equipped with a good transmission brake has little need for a servo mechanism, which necessarily involves considerable complication.

A weakness of the average transmission brake is its small heat radiating capacity. Owing to the relatively high speed of the shaft on which it is mounted, it is possible to obtain a high braking torque with a drum of small diameter. Cutting down the diameter of the drum neces-

sarily reduces the radiating or heat dissipating capacity of the brake, and the necessity for making up for this by increased width of the drum is not always clearly realized by the designer. There is, moreover, a serious drawback to an unduly wide drum, because the latter overhangs the rear bearing on the sliding gear shaft. With an overhanging load, the load on the bearing is always greater than the load on the shaft, and the wider the drum the greater the overhang. With a large overhang not only is there apt to be trouble with the rear bearing on the splined shaft but the brake carrier anchorage on the transmission case is also likely to cause annoyance, unless it is unusually substantial. The force of brake application, of course, takes effect in the center plane of the brake. To make a thoroughly sound job on a heavy vehicle it is well to provide bearing supports on both sides of the brake drum, and on lighter vehicles it is advisable to offset the hub of the drum from the braking surface so as to bring the center plane of the brake closer to the center of the supporting bearing.

Owing to the torsional flexibility of the shafts and other parts connecting the brake drum to the road wheels, torsional vibration often occurs in the transmission mechanism when a transmission brake is used. The more specific reason for the vibration is the constant variation in the adherence of the wheels when the car is passing over rough roads. Often the road surface inequalities are of a certain degree of uniformity, and such inequalities produce periodic variations in the brake torque. If this period happens to coincide with the natural period of torsional vibration of the transmission system, vibrations of considerable magnitude may be set up. However, uniformity in the road inequalities never continues for any great distance, and interference usually sets in and dampens out the vibration before any damage is done. The effect of bouncing of the wheels on the retardation is the same whether the brakes act on the transmission or the rear wheels.

The original practice, where one brake was mounted back of the transmission, was to make that the service brake and the rear wheel brake the emergency brake. The ease of application of the transmission brake favors its use as a service brake, because it does not matter much if a considerable effort has to be applied on the rare occasions when the emergency brake must be put in action. However, there are other aspects to the problem, and a considerable proportion of the American manufacturers who are now using a transmission brake use it as the emergency brake. They prefer the rear wheel brakes for all ordinary use because these are not so powerful and therefore reduce the chance that the brakes will be misused by being applied very forcibly when there is no occasion for it. Such "slamming on" of the brakes is certainly very injurious to the tires. From the point of view that it is more powerful the transmission brake is a better emergency brake than the rear wheel brake. On the other hand, the transmission brake, if it is located underneath the front floorboards, is easier to adjust and reline, and that makes it more suitable for a service brake, because the latter requires relining and readjustment much more frequently than the emergency brake. It will be seen that there are good arguments on both sides of the question.

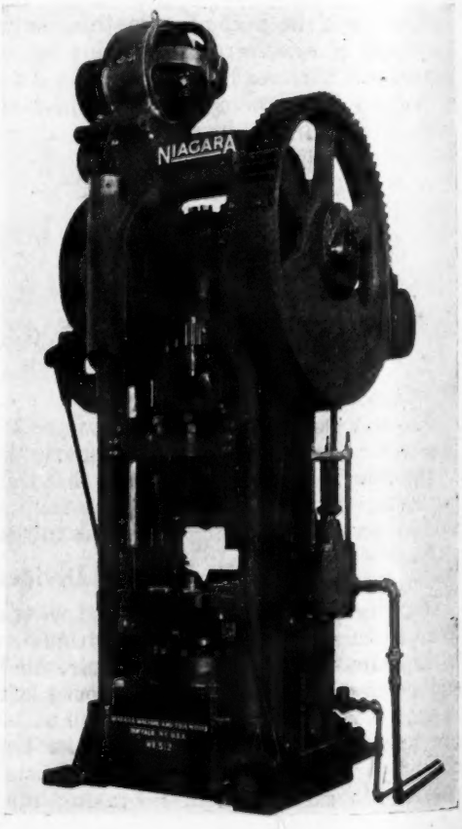
# Work Table Depressed in Novel Way on New Forging Press

DEPRESSION of the work table under unusual conditions is accomplished by a hydraulic safety release valve in the dial feed forging press made by the Niagara Machine and Tool Works. This feature eliminates the possibility of breakage of either the tools or some part of the machine as a result of the entrance of oversize or defective pieces into the dies.

As this press is intended for the manufacture of small forgings and stampings in continuous production, a power-operated dial feed is placed on the work table in conjunction with the dies. The work table in turn is bolted to a hydraulic ram of large diameter which is located in the base of the press. Under ordinary circumstances this ram is held in its extreme upper position by a column of water at the ordinary city water pressure. Water is taken from the city line and controlled by the check valve shown in the illustration.

If by any chance an over-size or defective piece finds its way into the dies through the dial feed, the resultant overload is not applied to the tools or frame and bearings of the press, but is nullified by the hydraulic safety release valve. This device consists of an adjustable spring blow-off valve, which is located in a chamber that is bolted to the right side of the press frame. This chamber is connected by heavy piping to the clearance space of the hydraulic cylinder which carries the ram. A total downward travel of the work table of 4 in. is permitted. After the work table has been depressed by some unusual condition, it is again returned to the working position by the pressure of the city water supply at the intake line.

Liberal sections and steel tension members in the uprights insure adequate rigidity. The total weight of the press is 40,000 lb. The ram is driven by a heavy crankshaft and reduction gears, belt drive from a countershaft or an individual electric motor being optional. A pinion and gear adjustment is provided for setting the ram which carries the upper dies or punches.




*Niagara dial feed forging press. Operation is controlled by hand lever shown in foreground*

# Prosperous South Offers Good Market for Next Six Months

By Harold F. Podhaski

THAT the automotive industry can look forward with assurance to a period of marked prosperity in the southern field during the next six months, and that the general business outlook in the South is as bright right now as it has been in a good many years, is the opinion expressed by L. L. Arnold of Atlanta, editor of *Cotton*, and probably one of the best versed men in the South on cotton prospects and general conditions throughout the district.

It is impossible to estimate with any degree of certainty what the cotton crop will be this year, Arnold states, due to the unusual weather conditions which have prevailed through the growing season, but present indications give promise of a total crop close to 12,000,000 bales, which, selling at the present prices, would net the South the largest sum by far that it has ever received from the sale of the staple.

A 12,000,000-bale crop would not be so large as to lessen the prices nor so small as to cause any marked upward tendency, so it seems practically certain now that the price will hold somewhere between 20 and 28 cents per pound, probably striking an average around 25 cents. At this price 12,000,000 bales of 500 lb. each would net the South around $1,500,000,000. This would be certain to result in a period of business prosperity such as the South has seldom enjoyed, and lasting for an indefinite number of months.

Discussing the present crop outlook from a sectional standpoint, it is found that a rather unusual condition prevails. In the Southwest general rainfall is very badly needed due to a long spell of exceptionally dry weather which, if it lasts much longer, will serve to deteriorate the growing crop to some extent. If there is sufficient rain to improve growing conditions the next few weeks Texas alone will produce close to 5,000,000 bales of cotton this year, one of the largest crops in the State's history.

In the Southeast exactly an opposite condition prevails. There has been entirely too much rain, and what that district needs now is a spell of hot and dry weather. The boll weevil is especially active this year in the Southeast, as it propagates very rapidly in wet weather. A spell of dry weather, however, would materially improve conditions, and the district would produce a very satisfactory yield.

In spite of these unusual conditions, however, the outlook as a whole for the entire belt is fairly satisfactory, and as stated above, present indications portend close to a 12,000,000-bale crop. It may be somewhat greater than this, or it may fall below the figure, this depending entirely upon general weather conditions throughout the belt during the remainder of the growing season.

Another factor of very great importance to the district, in that it serves to keep prices at a satisfactory figure, is the campaign that has been waged in various sections for the production of better cotton. The crops of 1921 and 1922 were, as a whole, of rather poor quality, due principally to the fact that farmers raised such a large quantity of the early maturing varieties in order to offset the boll weevil, which does not get in its real destructive work until the latter part of the season. These early varieties, as a rule, produce a rather poor staple, commonly known as butterfly cotton. This type is likely to have fibre of varying lengths on a single boll, and such cotton cannot be used for manufacturing purposes. For that reason the mills had to throw out thousands of bales of the 1921 and 1922 crops, and it became absolutely essential that the quality of the cotton be improved.

In Georgia a campaign for this purpose was inaugurated by the Georgia Cotton Manufacturers Association with the aid of State and Federal agricultural officials, and the cotton committee of the association has met with such success that this year's cotton raised in the State will be of a much better quality as a result. Similar campaigns have been waged in other sections of the belt, and with equally as good results. The desire is to secure a cotton with a longer staple, and at the same time one that can be successfully produced in spite of boll weevil conditions.

Further evidence that the South in facing a period of unusual prosperity is indicated by the fact that Northern cotton mills have, within the past few months, invested many millions of dollars in the purchase of existing mills in the district, or in the construction of new mills. Furthermore, mills already located in the South have been carrying out this year an expansion program that will make 1923 the largest cotton mill construction year in the history of the South. The reason lies wholly in the fact that cotton manufacturers see an era of prosperity coming in the South, and they are thus preparing for it ahead of time. The movement of the Northern mills to the South this year has been unprecedented.

The Federal Reserve Bank of Atlanta is authority for the statement that financially the South is in the best shape it has been for years, and with a good cotton crop in prospect selling at the best price in many years outside of war times, a still further improvement in the financial condition is virtually certain. Commercial failures throughout the South have shown a marked decline from month to month since the first of the year, both in the number and in the total liabilities.

So the automotive industry can look forward almost with an absolute assurance to a period of genuine prosperity in the South not only during the coming six months, but very likely through the greater part of 1924.

# Just Among Ourselves

W. C. DURANT and John Willys are running a pretty race for third place in the production sweepstakes. Willys is a lap ahead for the first seven months. At the halfway mark he had 107,000 and Durant about 103,000. This included Overlands and Willys-Knight as well as all the Durant lines. Ford is romping far ahead in first place. General Motors is second, and would be if it made only Chevrolets, for that division alone had made something like 240,000 in the first six months.

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JUST twelve months after the first experimental Stars had been put on the road, Durant had made 100,000 of them. It might be supposed that entry into the lowest priced field of this car, which evidently already is popular, might have had a somewhat adverse effect upon other makers, but such has not been the case. Ford is making and selling more than he ever did before and the same is true of Chevrolet.

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SOONER or later, perhaps, the productive capacity of plants making cars in this class will be in excess of the demand, but that day is not yet on the horizon. There seems to be an insatiable market for low-priced automobiles. A large percentage of purchasers are first buyers and they are bringing measurably nearer the day when every American family will have a car of its own.

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WITH Ford putting into effect his Christmas savings plan, and with other companies making time purchases easy, there are few families which cannot afford to spend the few hundred dollars involved in the initial cost of a car. It's the housing problem which is difficult. Where are you going to put the car after you get it? You can't leave it out in the open in all kinds of weather even if you have parking space available, and most apartment dwellers haven't. It's next to impossible in New York to get garage storage for less than $20 a month.

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THIS is one factor which is driving so many city dwellers into the suburbs. There they can have a garage of their own or they can rent one for much less than in the city. Little regret is felt at the sacrifice of amusements and other attractions found in the city for they are more than counterbalanced by the satisfaction of having a car. The temptation to spend money is lessened, and thus, in a relatively short time, the little automobile pays for itself.

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IN speculations about why so many persons are buying inexpensive cars, little consideration is given to prohibition—one factor which may be playing an important part. The weekly drink bill of the average working man in the days when there were saloons on every corner, if saved regularly, soon would pay for a Ford, and it would take care of the upkeep.

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THOSE who scoff at the effects of prohibition should not forget that it really prohibits, to a considerable extent, in many parts of the country. In those places where liquor of all kinds is easily obtainable, it is the working man who has given it up and not his more well-to-do brother. The worker can't afford to pay the price for good stuff, and he doesn't dare risk his life with anything else. Then, too, he always was more fond of beer than hard liquor. From the standpoint of the automotive industry, therefore, prohibition may be helpful.

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TWO more of the Durant line soon will go into production. The Flint, designed to compete with Buick and Studebaker, already is being turned out in small quantities and the Princeton, in the Cadillac price class, will come next. It is understood manufacturing plans have been changed, and that the Princeton will be made in the Locomobile plant at Bridgeport while the Eagle six will be turned out at Muncie.

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IT already has become apparent that unusual interest will attach to the new models which are being brought out this year. Several already have appeared and more are in prospect. Ford, for example, will announce some changes, although no one knows what they will be. He has been quietly making minor refinements for the past two years, but it is hinted the improvements this year will be somewhat more important.

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ONE of the real surprises in the way of a new line, it is understood, will be provided by a General Motors unit. It will involve going into a lower-price class and, it is reported, every effort has been made to bring the differential between open and closed models as low as possible. If plans work out as expected, only two direct competitors will be found. One of them will be a Durant product.

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MUCH speculation has been engendered by the announcement that Durant has discontinued use of Timken axles

# More or Less Pertinent Comment on Topics of Current Interest to Men in the Industry

and will put into his cars the product of one of his own subsidiaries. The Durant policy in relation to the major units he will employ in his different lines has not been made public, and its development is eagerly awaited in the parts field. Up to this time his products have been almost exclusively in the assembled class, but it must not be forgotten that he undoubtedly had more than anyone else to do with the development of the General Motors policy, which runs in an entirely different direction.

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THE Asbestos Brake Lining Association, an organization of manufacturers in that field, has undertaken a campaign to impress upon motorists the importance of frequent brake inspection. This effort is particularly timely because the police of many cities are arresting, in the interests of safety, drivers whose cars have defective brakes. Faulty brakes are the cause of many accidents because motorists take too much for granted. Service stations and garages could profitably extend the "ask 'em to buy" movement to brake lining. Not only would they be profiting themselves, but they would be promoting safety. It is a movement in which every branch of the industry can join whole-heartedly.

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AMERICA always has been proud of its good sportsmanship. Its representatives have been good losers as well as good winners in other lands, as well as their own, and they always are courteous to foreign rivals who come to our shores. It has not always been possible to say the same of the treatment accorded Americans in other countries. When Jimmy Murphy entered the French Grand Prix, for example. he wasn't exactly lionized either before or after the race. The way the French drivers in the Indianapolis race were received offers a pleasant contrast.

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IT was a surprise even to the Frenchmen themselves, as is witnessed by a paragraph in a letter from W. C. Bradley, European correspondent of AUTOMOTIVE INDUSTRIES. "The French group which went over for the Indianapolis race," he says, "was very much surprised at the wonderful reception it received. Naturally, they would have preferred to bring back a few prizes, but they all declare that the way they were treated made the trip worth while."

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EUROPEAN motor car manufacturers are not feeling particularly friendly toward their American rivals just now, and the lack of affection may be entirely natural. Their business is bad and has been ever since the war. They did not enjoy the remarkable renaissance which began in this country nearly two years ago. Cars built in the United States, especially in the low-price class, have captured foreign markets, much to the grief of makers in those countries who have found themselves unable to compete on a price basis.

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ONE of the big importers and exporters of Amsterdam, Holland, has given a rather graphic picture of the situation in a letter to AUTOMOTIVE INDUSTRIES. Because of financial conditions, he says, there is practically no demand for high-priced cars. As a consequence Ford, Chevrolet and Overland are getting the lion's share of the business. The cheaper cars are becoming more and more popular, and many persons who formerly used the medium-priced European cars are now buying the inexpensive American makes.

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ANY year which may have been felt that the purchasing power of the American wage earner is shrinking again should be mitigated by a report of the National Industrial Conference Board showing that the worker is more prosperous than he has been for a long time. His earnings have risen so much more than his living expenses that 1920 can no longer be considered the high water mark of recent years. Taking 1914 figures as 100, the index number of weekly earnings in June, 1920, was 240, while the cost of living index number was 203. The index number of weekly earnings in May, 1923, was 218 and the cost of living index number was 160.3. It will be seen, therefore, that while there was a difference of 37 points in June, 1920, there was a margin of 57.7 points in May of this year.

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"WE are becoming more and more confident," he writes, "that the U. S. A. will become the producers of motor cars for the whole world, and even the finer types of cars such as Rolls-Royce, Voisin and Hispano-Suiza are being equalled or bettered by the finer American makes. People over here do not buy a car for performance only, however, but more for what it looks like. We all know that polish does not make any difference in the behavior and performance of a car, but still people like it and are willing to pay a little extra for it."

Holland might be a good market for a low-priced, dolled-up sport model.

J. D.

# Body Finishing Costs Are Reduced by Progressive System

**Comparison of Overland and Willys-Knight operations indicate relative expense of enameling and painting. Former requires 5 hours and latter 7 days. Conveyor carries bodies without interruption from unfinished state to chassis assembly line.**

POSSIBILITIES for cutting finishing costs by enameling are demonstrated by contrast at the Willys-Overland plant in Toledo. Open cars for the Willys-Knight chassis and for the Overland are both finished in this plant. The Willys-Knight is a paint job and the Overland all-metal Budd body is finished with a high-temperature baking enamel. A week is required to finish the Willys-Knight and 5 hours to finish the Overland.

The Knight open cars are finished as rapidly as is possible for a high grade painting job. The modern equipment includes Drying Systems, Inc., humidified ovens, which have materially reduced the drying time. The color varnish and even the finishing coat is applied by the flow-coating method which materially saves time over the brush.

Inasmuch as these two bodies are finished in the same plant, an interesting comparison can be made of the time required. The Willys-Knight body, a wood-framed type, is painted in color, while the all-steel Overland, being enameled, is black. The contrast serves to bring home clearly what saving in time will be made when some fortunate chemist discovers a successful color, low-temperature, baking enamel. That such a discovery will be made during the next few years seems likely and hence keen interest exists in a comparison of this kind.

The Knight bodies leave the wood shop ready to be cleaned. They are coated with Rexo cleaner, which helps to cut grease and prevent rust. After cleaning they are sprayed both inside and out with metal primer, and then are placed in an oven and dried for 4 hours at 150 deg. Fahr. Leaving the oven, they are putty glazed all over and inspected.

The putty glaze is dried in an oven for 3 hours at 150 deg. Fahr., after which the bodies are sprayed with rough stuff and again put back in the oven for 3 hours at 150 deg. Another coat of rough stuff with an oven dry for 3 hours at 150 deg. is followed by a sandpaper rubdown. The sandpaper employed is the Wetordry manufactured by the Minnesota Mining & Mfg. Co. This sandpaper operates as its name implies when either wet or dry, being a waterproof composition.

### Inspection Follows Rub

Following this rub, the bodies are inspected and air dried. If any spot puttying is required, it is done at this time. Then the bodies are put back in the oven again at a temperature of 150 deg. for 3 hours. The putty is again sanded out with the Wetordry sandpaper and a coat of blue sealer sprayed on. This coat is allowed to dry over night, if this operation comes toward the close of the day; if not, it is optional with the foreman to put the bodies in the oven for a 3-hour dry at 150 deg.

Another sanding operation with the Wetordry sandpaper follows, after which the bodies are tack-ragged and the first coat of color varnish is flowed on. The top of the cowl is brushed with the color varnish, as flow-coating has been unsatisfactory for this part.

The color varnish is dried in a pre-heating oven which ranges in temperature from 120 to 125 deg. In 1 hour this sets the surface for the regular drying oven, into which the bodies go next. This oven is held at factory

## Painting Operations on Willys-Knight Open Car

1—Clean
2—Spray with metal primer
3—Oven dry 4 hr. at 150 deg. Fahr.
4—Putty glaze
5—Oven 3 hr. at 150 deg.
6—Rough stuff spray
7—Oven 3 hr. at 150 deg.
8—Rough stuff spray
9—Oven 3 hr. at 150 deg.
10—Sandpaper and rub
11—Air dry
12—Inspect, sandpaper and spot putty
13—Oven 3 hr. at 150 deg.
14—Sandpaper spot putty marks
15—Spray coat of blue sealer
16—Dry over night
17—Flow coat color varnish
18—Brush top of cowl color varnish
19—Pre-heat oven 1 hr. at 120 deg. Fahr.
20—Dry over night at 150 deg.
21—Dry sand and tack rag
22—Flow coat second color varnish
23—Pre-heat 1 hr. at 120 deg.
24—Dry over night at 140 deg.
25—Inspect
26—Trim
27—Pumice rub
28—Clean, shellac wood edges
29—Flow coat finish varnish
30—Dry over night at 96 to 102 deg. Fahr.

temperature during the day while being loaded. At night the oven is heated to 150 deg. temperature and is held there for about 13 hours.

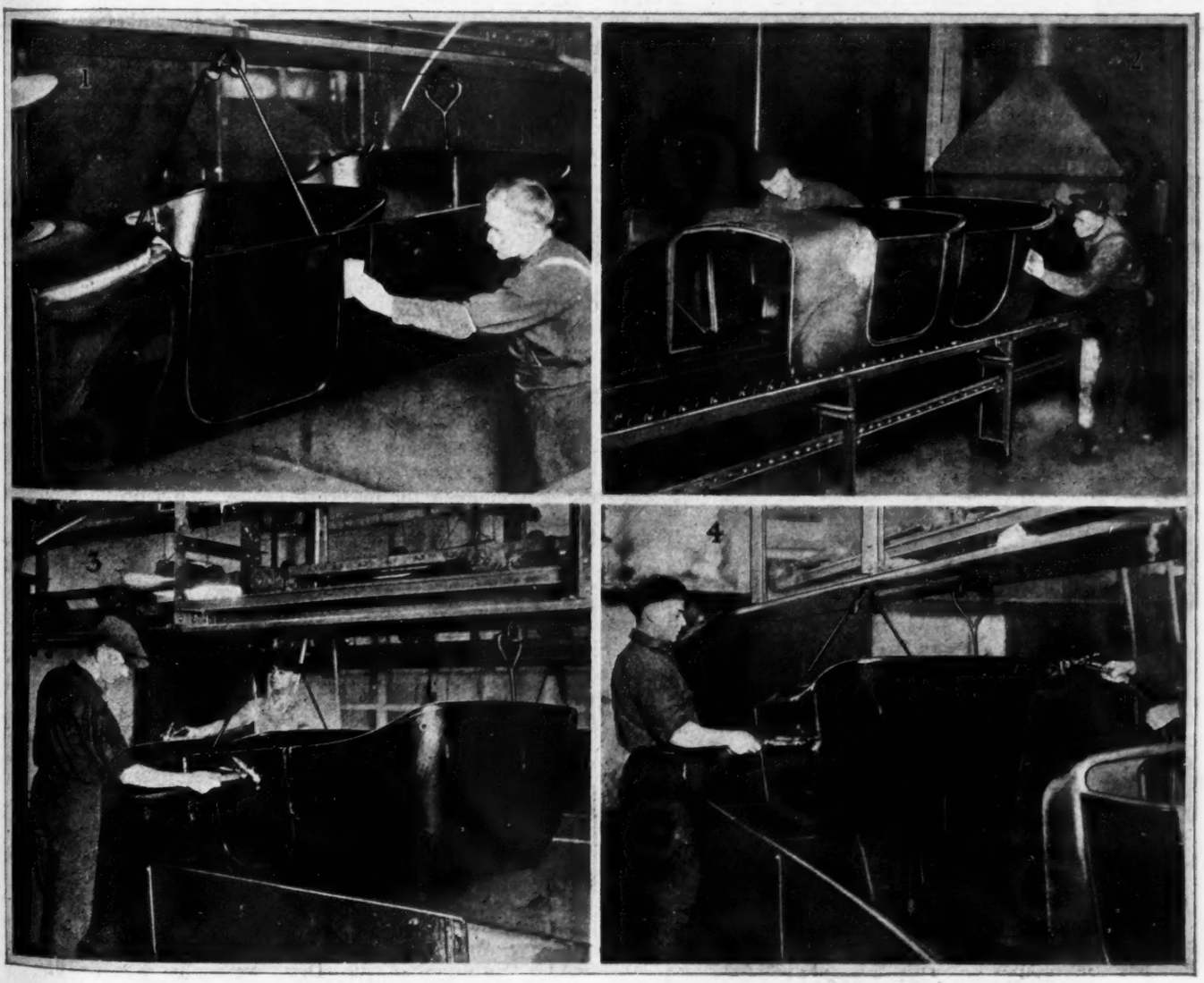
### Sandpapered After Baking

After the bodies are taken from the oven they are dry sanded with Wetordry sandpaper, are given a tack-rag and are flow-coated with the second coat of color varnish. Another pre-heating operation for 1 hour is given after the second coat of color varnish and the bodies are loaded on end in ovens in the same manner as after the first coat of color varnish. They receive an over-night dry in the oven at a temperature of 1140 to 145 deg., a trifle less than used after the first color varnish operation.

The following morning the bodies are inspected by the man in charge of the flow-coating operation. This man is responsible for proper flow-coating and any bodies which he rejects go back through the process. Those which are accepted are sent to the trim room. Here the trimming operations are carried on progressively and when completed, the bodies are sent back to a rubbing deck where they are rubbed down with pumice and put in condition for the finishing varnish. The finish varnish is applied by a flow-coating operation instead of being brushed on as is common. Just before the finish varnish is flowed on, however, any wood parts which are apt to hold lint or dust are shellaced. Following the finish varnish, the bodies are baked from 12 to 14 hours at a temperature ranging from 96 to 102 deg. Fahr.

Enameling operations on the open Overlands constitute an improved progressive system. The conveyor line starts at the point where the bodies are cleaned before the enameling operations and passes through the oven in subsequent cleaning and enameling and finally into the body assembly department. Starting in as raw bodies in the white, the units leave the conveyor line as complete bodies ready for the chassis. They are transferred to another conveyor which takes them back to the point on the chassis assembly line at which the chassis are ready to receive the bodies. Consequently, there is no break in the movement of the bodies from the time they leave the cleaning operation until they drop off the end of the final assembly line as parts of complete cars. Throughout the chain of operations required for finishing the bodies, the car is moving at a conveyor speed of 3 ft. per minute. It takes the body about 5 hours to complete its trip through the finishing operation.

The Overland company receives completely assembled bodies from Budd. The first operation at the Overland plant is a wash and an inside spray. Following this, the




*1. Sandpapering body where necessary to correct minor imperfections. 2. The conveyor is continuous through the three ovens. While the bodies pass through the gaps between the ovens they are rubbed with Wetordry sandpaper before the next coat is applied. 3. Flowing on the second coat of enamel on the Overland all-steel body. 4. Flowing the first coat of rubbing enamel on the all-steel Overland body*

## Painting Operations on Overland Open Bodies

**1—Wash**
**2—Inside spray enamel**
**3—Take off grease and dirt**
**4—Inspect, grind and emery**
**5—Air-blast**
**6—Tack-rag**
**7—Flow coat of rubbing enamel**
**8—Bake 55 min. at from 350 to 460 deg. Fahr.**
**9—Inspect and rub**
**10—Flow-coat first finish enamel**
**11—Bake 55 min. at from 350 to 460 deg. Fahr.**
**12—Inspect and rub**
**13—Flow coat second finish enamel**
**14—Bake 55 min. at from 350 to 460 deg. Fahr.**
**15—Inspect**
**16—Trim**

bodies pass through a preliminary oven which bakes off the grease and dirt. Then they are examined by inspectors, ground off where necessary, emeried for the minor imperfections, wiped, blown off with an air blast, tack-ragged and passed to the flow-coating operation.

The first coat flowed on is a rubbing enamel. The body passes immediately from the flow-coating operation to the conveyor, which takes it through the oven. It takes 55 minutes for the passage through the oven, which is held at a temperature ranging from 350 to 460 deg. Fahr. The temperature is stepped up from the low limit to the high limit through a three-panel control as the bodies progress through the oven.

After leaving the oven on the conveyor, the body continues to move, being inspected while it is going. The first finishing coat also is flowed on while the body is passing along the conveyor. The conveyor enters the second oven, which is exactly the same as the first. When the body leaves the second oven the second coat of finish enamel is applied and a third oven is passed through, completing the finishing operations. Those bodies which pass inspection continue right along the conveyor into the assembly line where the detachable upholstery is applied and the body hardware fitted. The time actually required on the conveyor is 3 hours 20 minutes. With the preparation, inspection, etc., the body receives, besides when it is on the line, a total of 5 hours is required for finishing the body.

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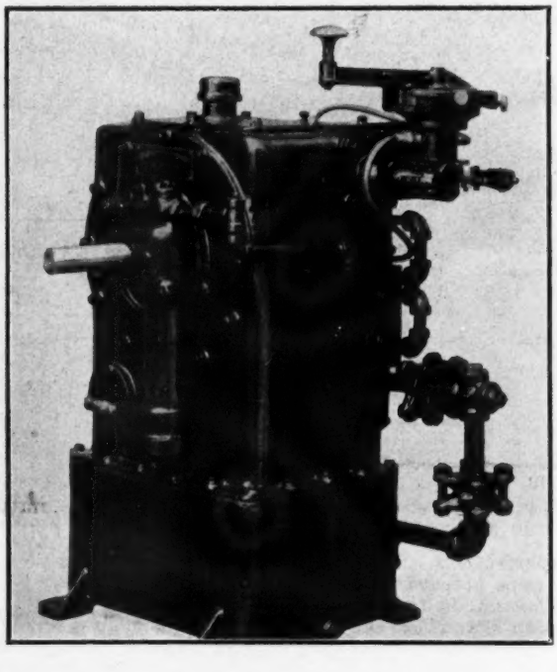
# Variable Delivery Pump Developed for Hydraulic Presses

A COMPACT variable delivery pump, known as Type-W, has been perfected recently by the Oilgear Co. It is especially designed for hydraulic presses and similar service, has a maximum capacity of 3060 cu. in. per minute and a maximum working pressure of 1000 lb. per sq. in.

The rate of oil delivery to the press cylinder is controlled by means of a single handle or lever attached to the stroke-changing mechanism through a hydraulically-operated control cylinder. According to the manufacturer, the pump responds instantly and smoothly to the operation of the control handle as regards both variation of the rate of oil delivery and reversal of direction.



In design and construction the essential parts of this pump are similar to those of the Oilgear type QO control pump. The assembly of the plungers and cross heads differs from that in the type QC in that the plungers are closely coupled to the cross heads. This provides a suction action that makes it unnecessary to depend on a large auxiliary gear pump. The Type-W is equipped with a small gear pump to keep the running parts lubricated and to operate the control cylinder.

The hydraulic control for regulating the stroke of the main pump consists of a double-acting hydraulic cylinder and a piston which is attached to the stroke-changing arm by a cross yoke and two links. These are so arranged that a heavy spring holds the pins against one side of their bearings in the links, cross yoke and arm, thereby preventing any play in the joints. Oil pressure to the control cylinder is regulated by a small balanced piston valve that admits oil to one end of the cylinder and at the same time allows it to flow from the opposite end. This construction provides a hydraulic dashpot which holds the arm rigid in any position.

The oil is delivered from the ports through the passages in the main pintle, down through one of the two passages provided in the casting which forms the arm on which the pump unit rotates. When oil is flowing down through one passage, it is being drawn up through the other. The oil passages in the arm communicate with suitable passages in the lower pintle and these in turn with the delivery and intake pipes.

# Modern Methods Gaining Recognition Among Spanish Car Salesmen

**Lack of confidence in American manufacturers is generated by rapid changes in dealers and territories. Our products are well adapted to market and are making great progress. Social customs must be understood when agents are being selected.**

By L. H. Schultz
*Formerly with Automotive Division, Bureau of Foreign and Domestic Commerce*

SUCCESSFUL merchandising of automobiles in Spain requires sales methods which differ from those used in this country. The temperament of the people and the social customs of the country are such as to render ineffective many plans which have brought excellent results in the United States. A thorough understanding of these differences is essential to proper marketing of cars in Spain.

American cars dominate the market at the present time and are preferred by most Spanish owners because they meet particularly well the operating requirements of the country. The factors favorable to the sale of American cars are:

1. High power and hill-climbing ability. Spain is a very hilly country and owners of European cars find touring less pleasant than do American car users. The Spaniard, moreover, likes speed, and the ability of American designs to cover ground rapidly appeals to him.

2. Standardization, which results in relatively rapid and efficient service. The ability of American car dealers to replace parts and render service quickly is a big help to further sales. In this respect the European cars are far behind.

3. American cars can be obtained readily with complete bodies. Most European jobs are built with chassis alone. This requires the Spanish dealer to go to considerable trouble and expense in providing a body.

4. Quantity shipments can be obtained from America and cars can be provided when they are needed.

5. Relatively large discounts on American cars encourage dealers to handle these lines. Discounts on American cars range from 15 to 22 per cent, as against 10 to 15 per cent on European makes.

## Obstacles to Success

To offset these favorable factors one very important obstacle exists to the maximum distribution of American cars in Spain.

American manufacturers have made many rapid—and to the Spanish mind, uncalled for—changes in agencies and territories after a distributor has spent considerable time and money in building up a business. This practice has resulted in a lack of confidence among Spanish dealers, which undoubtedly will be reflected ultimately in car sales.

Spanish agents advance many arguments in favor of handling American lines in preference to European ones, but they always end up with this question:

"What will happen after one or two years, when I have spent many thousands of dollars in developing my territory?"

All American manufacturers, of course, are not responsible for this condition, but all are affected by it. American cars are making progress despite certain unsound practices in dealing with agents, but individual makes are undoubtedly suffering.

Obviously, certain organization changes are necessary from time to time, but such moves should be made with a proper consideration of the efforts of men who have handled the line in former years. One big American firm which has been well established in Spain has recently subdivided its territories. It went about the work so undiplomatically that most of its important representatives in Spain are figuring on leaving the organization and taking on some other line. As a matter of fact, another big company, proceeding along constructive lines, has already picked up many of the dissatisfied dealers and is rapidly building up a strong distribution organization.

## Confidence Must Be Maintained

The importance of maintaining the confidence and good-will of the Spanish distributing organization is emphasized by a more detailed knowledge of selling methods and customs in that country. Good dealers are harder to get than in the United States. In addition to financial stability and selling initiative a good social standing and wide personal acquaintance is essential to successful passenger car merchandising in Spain.

A dealer cannot "ask 'em to buy" until he has met his prospects socially. He cannot solicit business from a stranger. If the stranger comes to the dealer or invites the dealer to come to see him a sale may be made, but a personal call by the dealer without previous social contact is met with barred doors. Efforts in general selling are being made now, but progress is slow.

Form letters have been tried without success, while other useful American merchandising methods have been applied with equal failure.

Advertising has been used only recently. This form of sales effort is bringing good results to dealers in low and middle-priced cars. The benefits accruing from it have finally reached a point where they are recognized as well worth while. Practically all dealers and distributors are using advertising to an increasing extent. Dealers in high-priced cars, however, still insist that advertising does not pay.

Advertising is carried in both local and national dailies, the latter charging from $300 up for a full page. In the past, when one distributor had the whole country, it might have been well to carry a list of the various local dealers on the advertisement when using a national

paper, and even charging each one a small amount to assist the importer in paying for his expensive advertising. This has rarely been done. It would seem, however, that with divided territory this policy might well be put into effect through an arrangement between the various distributors if national papers are to be used. A list of importers or distributors and also of local dealers in the leading centers could well be carried with the expense divided suitably.

The success of advertising has encouraged certain merchants to try out various other advanced selling methods. A large distributor in Madrid, who has recently taken on a popular American line, offers a good illustration of what some progressive organizations are doing along this line. The manager of this branch employs several high-class salesmen and has, in addition, a large circle of personal friends who act as salesmen on the side. These friends usually are given a commission of 5 per cent on all sales which they make.

This company has a prospect list and uses a prospect follow-up card. More steps of this kind are contemplated in the future. Plans are under way to go after rural sales, most of the past business having been developed in cities.

Dealers will be placed in various centers and will be given a commission of about 20 per cent, provided they have a proper showroom, a repairshop and service station. Sub-dealers in smaller towns will receive 15 per cent commission and will own a demonstrator. This latter class of retailers often sell cars as a side line, their major business being in other fields.

## Distribution Needs Outlined

An exact outline of distribution needs in Spain cannot be given for all makes of cars, since many variables are involved. Distributors of high-priced vehicles do not have to be represented at as many points as do those of low- and middle-priced lines.

In general, however, it may be said that a medium- or low-priced line should have distribution in the capital of each province. All distributors who do not have such representation at present are making plans to get it at the earliest possible moment. Several agencies would be desirable in certain provinces. As a matter of fact, dealers usually have friends in smaller towns who sell cars on commission. Most of Spain is being covered in this way today.

One agent cannot cover the whole country in any case. Some division must be made. Following is a good general outline which may be applied with necessary variations for the requirements of individual manufacturers:

| *To be handled from:* | *Including provinces of:* |
|---|---|
| Barcelona | *Gerona, Barcelona, Lerida, Huesca, Zaragoza and Tarragona, and usually Balearic Islands.* |
| Valencia | *Castellon, Teruel, Cuencia, Alabacete, Valencia, Alicante.* |
| Almeria or Granada | *Murcia, Ciudad Real, Jaen, Granada, Almeria.* |
| Cadiz or Seville | *Cadiz, Malaga, Seville, Cordova, Huelva, Badajoz.* |
| Madrid | *Toledo, Caceras, Madrid, Avila, Salamanca, Quadalajara, Soris, Segovia, Valladolid.* |
| San Sebastian, Bilbao or Santander | *Navarra, Alava, Guipuzcoa, Viscaya, Santander, Palencia, Burgos, Legrono.* |
| Vigo, Gijon, Oviedo or Lugo | *Leon, Oviedo, Lugo, Coruna, Pontevedra, Orense and Zamora.* |

Most intensive sales work in Spain has been developed during the last year, as automotive expansion is expected to go forward very rapidly from now on. Agents are not always easy to secure, however, and the distribution acquired by an individual manufacturer depends largely upon his ability to get the representation which he desires.

It must be borne in mind, however, that the above outline can in no way be taken as final, changes being absolutely necessary according to the line to be handled, the number of cars available for the market each year, and the facilities of the different distributors. A province might easily be taken from one section and added to another, or several groups might be combined.

## Service Policy Good

The above outline is a general summary of the recent revision in territory made by one of America's biggest automotive exporters for a medium- and low-priced line. Other popular American cars have been given to two, three and four distributors, with the outlook of less intensive work, and in some cases with a limited number of cars available for the Spanish market each year.

American servicing policies have been adopted by Spanish dealers, every full dealer carrying stocks of repair parts and having one or two mechanics. The larger organizations have from fourteen to twenty mechanics and helpers, who for the most part are able to make repairs required. A few dealers have started the flat-rate system to some extent; that is, they place a repair job price on some operations, such as overhauling, replacing rear end, removing carbon, etc., but the mechanics are not skillful enough to judge all jobs as to the time required, and the dealers are, therefore, required to charge by the hour in the old way. The start toward this better method is at least encouraging, however, and it may be expected that the complete flat-rate system will be adopted as soon as possible.

One dealer, when asked about the matter, said that the system had its drawbacks owing to the slowness of the mechanics. They receive about $2 per day, and earn no more. It is impossible still to pay a mechanic on a piece-work basis, as it is claimed that his anxiety to start on another job would prevent his doing properly the one he was on. All of these points can be corrected, of course, when there are more mechanics, but at present it is difficult to secure a good man, and if his work is not right he must be kept and watched anyway, in order to get something done. Chief mechanics in the various shops are eager to learn new methods of doing their work.

## Motorcycle Market Decreases

Agents for European cars are not able to make repairs with the speed of American car agents owing to the lack of service policy of the manufacturer, and the American car is preferred here for that reason, as in every other country.

The motorcycle market in Spain has been excellent in past years, but the relative high price of the two-wheeled vehicle as compared with low-priced four-wheelers is decreasing motorcycle sales to some extent. Sidecars are almost always used with motorcycles and each vehicle usually carries 3 or 4 persons, sometimes 6.

Competition from British cyclecars is not likely to be of much importance, because these vehicles are not capable of making the hills in Spain. The motorcycle is still finding a market among those Spaniards who have a desire for speed and sport while the low-priced car is taking its place as the family vehicle.

# "Teaser" Advertising Plays Important Part in Announcement of 1924 Buick

***Prices are withheld until seven days after new models are put on display. National publicity tied up closely with local dealers. Newspaper and trade paper men taken into confidence.***

By D. M. McDonald

A SERIES of well-prepared "teaser" advertisements, close hook-up of national publicity with local dealers, placing of 13,000 cars in the hands of dealers on or before August 1 and withholding prices until seven days later were outstanding features of the campaign used in putting over the 1924 Buicks. The policy of taking newspaper and trade paper representatives into confidence for several weeks preceding public display of the new line, aided materially in maintaining the absolute secrecy desired and in getting over maximum publicity when it was wanted.

By use of these methods Buick Motor Co. estimates that it aided in the sale of 30,000 cars that might not have been disposed of, had not hundreds of thousands of persons been brought into dealer sales rooms. Buick's total sales for the year were about 182,000.

Campbell-Ewald company were charged with the origination of the advertising. Absolute secrecy about the models was enjoined until the first of the special advertising series was to appear. Taking the newspapers into confidence kept the story from the public until the stage was completely set.

### Mystery Campaign

On three days before August 1 advertising copy of a teaser nature appeared in all leading newspapers of the country, representing a hand completing an announcement, "August First Is Buick Day." On August 1 the same papers carried an announcement headed "Today Is Buick Day," and announced the 1924 line. There were no descriptions of the changes, nor of prices, in any advertising until the following Sunday, the whole thought being to have the interested person step into the sales room to see the car and hear about the changes there.

In the meantime the company, through E. T. Strong, general sales manager, had arranged for the reception of the public in the sales rooms, by laying out a complete set of instructions as to display, and by instructing all field representatives, branch managers, distributors, and salesmen in the features of the new line.

Field representatives, branch managers and distributors were brought into the factory and whole days were spent in outlining plans to them. They in turn instructed their dealers in groups and the dealers carried the word to the salesmen. By the morning of Aug. 1 the entire sales organization was to be familiar with every detail of the cars, but on no account were they to discuss them previous to that date with anyone outside the organization.

Stripped chassis were sent to the branches and distributor cities for use in conjunction with the display of new models. These were demonstrated by service managers or shop superintendents who previously had been brought to the factory and instructed in all the mechanical features. This served the dual purpose of assisting in the demonstration of the chassis and of preparing the sales organization to give immediate service on the new line.

About 13,000 cars were in the hands of the sales organization on Aug. 1 and so far as possible every dealer's sales room had at least one. That the dealer might be in position to demonstrate the complete line as fully as possible on that day, he was furnished with display posters, two of which presented pictures of the complete line of models in the four and six cylinder lines, and the third listing the mechanical changes that had been made. As rapidly as possible he was given the cars themselves that he might add interest to his display.

### Price Announcement Delayed

Announcement in the newspapers of the prices was held up until the following Sunday to incite the personal attendance of those interested. In a line as well known as Buick the question of price was considered to be the one which would be surest to arouse interest to the greatest point.

With all of this preparation the company took means to keep people talking Buick by running a series of "Have you seen the new Buick" advertisements, in all leading papers of the country. Even the barber was asking his patron as he shaved him "have you seen the new Buick?" Every member of the family was considered in these ads, the children showing their interest by appealing to the parent. All Buick wanted was to keep that question coming up, and sooner or later it figured everyone would have to see the new Buick or be lost in the conversation of the week.

## Applying Metallic Coatings

ACCORDING to *Revue de Metallurgie*, when metals are applied to a thoroughly clean surface by the Schoop spraying process the coating formed is very tenacious. The strength of this adhesion was thoroughly proved during the war, when metallic coatings were applied to shells and other projectiles; after firing, the coating was found still adhering perfectly to the fragments of shell. Further experiments have proved that the applied metal will resist vibration, bending and even twisting without flaking off. Since the strength of the adhesion on a given surface is not the same for all deposited metals, it cannot be assumed that adhesion results entirely from the interlocking of the projected particles with the minute inequalities of the surface. Of the metals most commonly used for deposition the following is their order in strength of adhesion on an iron surface: Zinc, aluminum, lead, tin, copper and bronze. Aluminum and zinc adhere strongly to copper, as does also tin.

# California Research Tests Efficiency of Air Cleaners

**Standard dust obtained from various tractor-using areas in all parts of the State. Micrometer microscope used to measure particles. Weidely engine used in making experiments. Results show what may be expected if cleaner is neglected until filled.**

PROBABLY in no State of the Union is the damage done by dust to farm machinery, and especially to farm tractors, so great as in California, whose soil is made up in part of volcanic ash. It is therefore entirely fitting that the University of California should have undertaken a series of tests to determine the efficiencies of various types and makes of air cleaners as fitted to tractor engines for the purpose of obviating or minimizing this damage. The tests referred to were made by Arthur H. Hoffman, research specialist of the Engineering Division of the Agricultural Experiment Station, and were reported on by him in a paper presented to the American Society of Agricultural Engineers at its annual meeting at St. Louis in December last and in a pamphlet on Dust and the Tractor Engine, published by the University of California Press, Berkeley. The following abstract from these papers covers the methods used in the tests and the results obtained in a brief way.

Previous to the California tests very little had been done in the way of air-cleaner tests on a scientific basis, and a certain amount of pioneering was therefore necessary. Tests in actual service in the field proved impracticable, and in order that the laboratory tests might be fair to all of the cleaners submitted, it was necessary to prepare a dust for the tests that was representative of the dusts met with in different parts of the State. Great care had to be exercised in regard to the method of feeding this dust to the cleaners, and finally it was necessary to devise a method for accurately determining the percentage of the dust in the air which was removed by the cleaners, as the percentage of the dust removed may be regarded as the efficiency factor of the cleaner.

**Table 1—Identification of Cleaners Tested**

| No. | Make or name | Type | Weights | | Size of body proper, Height, Length, Width, inches |
|---|---|---|---|---|---|
| | | | Clean dry, lbs. | Ready for use, lbs. | |
| 1 | Case | Wet | 18¾ | 39¼ | 19½x12D |
| 2 | Clectrac W | Wet | 57¼ | 74½ | 14 x13x9 |
| 3 | Dailey | Oil | 11¾ | 12 | 18 x7½D |
| 4 | Dailey | Oil | 12 | 12¼ | 18 x10D |
| 5 | Donaldson | Oil & Dry | 5¾ | 5¾ | 16 x8D |
| 6 | Donaldson | Dry | 5¼ | 5¼ | 12 x11D |
| 7 | Donaldson | Dry | 2 | 2 | 11¼x 8D |
| 8 | Donaldson | Wet | 15 | 10 | 17 x 9D |
| 9 | Fageol | Oil | 9¼ | 9¼ | 13½x10¾D |
| 10 | Fordson | Wet | 40¼ | 53¾ | 12 x14½x6 |
| 11 | I.H.C. | Wet | 18 | 34 | 18½x10½D |
| 12 | Palmer | Oil | 9½ | 15 | 18 x8½D |
| 13 | Success | Dry | 10½ | 10½ | 15 x 8D |
| 14 | R.W. | Wet | 8¾ | 18½ | 15 x 9D |
| 15 | Stewart-Warner | Wet | 7 | 16¼ | 13x9Dx16½ |
| 16 | Taco Siphon | Wet | 44½ | 56 | 12½x16x7½ |
| 17 | Eiderdown (closed) | Dry | 9 | 9 | 26 x12½D |
| 17′ | Eiderdown (open) | Dry | 5 | 5 | 19 x10D |
| 18 | United collector | Dry | 8¾ | 8¾ | 10½x 5D |
| 19 | United ejector | Dry | 2½ | 2½ | 7 x 5D |
| 20 | Pomona | Oil | 4 | 5¾ | 13½x 4½D |
| 21 | Pomona | Oil | 3¼ | 5 | 13 x 4½D |
| 22 | Pomona | Oil | 9 | 16½ | 15 x10D |
| 23 | Bennett | Dry | 4½ | 4½ | 9 x 6D |
| 24 | Samson | Wet | 27¼ | 42½ | 14 x12½x7 |
| 24A | Samson | Wet | 28¼ | 37¼ | 15 x10D |
| 25 | Stromberg | Dry | 3½ | 3½ | 14 x 6D |
| 25A | Stromberg | Dry | 3½ | 3½ | 14 x 6D |
| 25B | Stromberg | Dry | 4¾ | 4¾ | 16 x 7½D |
| 26 | Dailey | Oil | 10 | 10½ | 17½x10D |
| 27 | Bennett | Wet | 8¼ | 15¼ | 12 x 9D |

To obtain a standard dust, 50-lb. samples of surface soil were secured from ten tilled fields and orchards in the tractor-using areas of the State, none of these containing any volcanic ash, however. The soils were separately dried at about 230 deg. Fahr. and pulverized by a process similar in its effects to pulverization by tillage implements, which did not break up the sand granules. After redrying and passing through a 16-mesh screen, the soils were fed through a funnel into the tube shown at A in Fig. 1. This conveyed the soil into the fan of an electric blower as used with forges, whence it was blown into the lower compartment of the box and a part of it circulated again and again through the blower. A part of the air entering the blower came from the tube shown, partly filling the fan intake. This tube drew a slow current of dust-laden air up past the two baffles, over the shelves, through the false back of the box and back to the blower. The baffles prevented heavy or coarse particles from passing, and the extremely slow air velocity over the shelves allowed much of the finer dust to settle out. The process, referred to as the air-floating process, was repeated until enough dust had been separated from a given 50-lb. soil sample. The amount of dust taken from the different samples varied greatly, from 0.61 lb. from Oakley sand to 16.98 lb. from Honcut silt loam.

Measurements of the dust particles were made with a micrometer microscope, and it was found that their dimensions varied from a minimum of 0.00012 to a maximum of 0.006 in. A No. 1 standard dust was made up from the various air-floated dusts to which 1 per cent of Goldridge fine sand was added. The material was dried, thoroughly mixed in a revolving churn, redried, weighed out into 50-gram samples while hot, and bottled at once, and the bottles were stored in closed vessels with a desiccant until used. Chemical analysis showed that there was 1.79 per cent of moisture in this dust, which passed off at 105 deg. Cent., 7.13 per cent of organic matter, which passed off at red heat, and 5.36 per cent ash was produced by acid treatment, leaving 85.72 per cent of residual mineral matter. Of the original dust, 55 per cent consisted of silica ($Si\ O_2$). This No. 1 standard dust was used in all of the regular efficiency tests. A No. 2 standard dust was used in the "filling up" tests. It consisted of a mixture of the residues

from a number of the soil samples in the air-floating process. After being dried it was passed through a 16-mesh screen, mixed, placed in a closed vessel with a desiccating material and weighed out as needed in the "fill-up" tests.

After consideration and practical tests of a number of feeding methods the following method was decided upon: A standard quantity of 50 grams of the dust was placed in a sheet metal tube of rectangular section and was pushed by means of a plunger at a slow, uniform rate against the edge of a bristle brush wheel revolved by a slow-speed electric motor. The latter was located in a housing through which the air passed on its way to the cleaner. An inner housing reduced the centrifugal blower action of the brush wheel to a minimum. The plunger was actuated by means of a screw-and-nut mechanism and a pawl and ratchet from an electromagnet energized by current from a 32-volt storage battery, the circuit being opened and closed by a contact pendulum. By varying the pitch of the feed screw and the period of the contact pendulum, the time for feeding the 50-gram sample could be varied from 15 min. to 8 hr., but the samples were usually fed in 30 min.

The apparatus used in the efficiency tests were set up as shown diagrammatically in Fig. 2. At the end of each efficiency test run the small amount of dust remaining in the tubes and housings was swept into the ingoing airstream by means of a small feather brush, and no dust was lost. In order to insure that the air entering the apparatus was clean, the latter was inclosed in a cage F (Fig. 2), most of the wall surface of which consisted of eiderdown blanketing, through which the air was filtered. A number of adapters had to be used between the dust-feeding apparatus and the cleaner, and in the design of these adapters great care was exercised not to change the vacuum efficiency of the cleaner.

To weigh the air cleaner without and with collected dust, thus determining the weight of the latter by subtraction, was found impracticable, as scales having a sufficient range are not sufficiently sensitive, besides which a correction would have had to be made for

**Table 2—Summary of Tests**

| No. | Make or trade name | Dust separating efficiency per cent | | | Vacuum | | | Maximum power with cleaner on | Ratio hp. with cleaner on: to hp. with cleaner off, per cent |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | At 20.4 hp. 1200 r.p.m. inches water | | | | |
| | | Average all tests | Service run | Low Water or oil | Cleaner clean | 150 gram No. 1 Std. dust in | At maximum hp. and 1200 r.p.m. inches water cleaner cleaned out after efficiency tests | | |
| 1 | Case | 96.0 | 96.1 | 95.2 | 13/64 | 1 11/32 | 2.6 | 27.0 | 100.0 |
| 2 | Clectrac W | 89.3 | 85.8 | 83.6 | 3 1/16 | 5 1/32 | 8.5 | 26.6 | 98.7 |
| 3 | Dailey | 99.5 | 99.9 | | 6 1/64 | 22 1/64 | Run lo | st due | to error |
| 4 | Dailey | 99.8 | 99.9 | | 5 1/64 | 18 | 10.7 | 26.6 | 98.7 |
| 5 | Donaldson | 97.8 | 98.0 | | 3 1/64 | 20 3/64 | 4.5 | 27.2 | 100.6 |
| 6 | Donaldson | 74.7 | 67.4 | | 1 5/64 | 2 7/64 | 3.8 | 27.1 | 100.3 |
| 7 | Donaldson | 51.0 | 50.3 | | 2 1/64 | 2 1/64 | 4.2 | 27.1 | 100.2 |
| 8 | Donaldson | 96.5 | 97.3 | 95.0 | 2 5/64 | 4 3/64 | 7.4 | 27.0 | 100.0 |
| 9 | Fageol | 98.5 | 99.5 | | 4 1/32 | 16 | 12 8 | 25.7 | 95.2 |
| 10 | Fordson | 88.9 | 89.8 | 85.5 | 7/64 | 1 1/32 | 3.3 | 26.8 | 99.3 |
| 11 | I.H.C | 94.6 | 94.4 | 92.3 | 2 1/32 | 2 3/64 | 3.5 | 27.4 | 101.7 |
| 12 | Palmer | 96.6 | 96.9 | 94.7oil | 4 | 6 | 6.3 | 26.9 | 99.6 |
| 13 | Success | 98.7 | 97.8 | | 1 1/32 | 27 1/64+ | 2.2 | 27.0 | 99.9 |
| 14 | R.W | 93.1 | 92.6 | 92.6 | 3 1/64 | 3 5/64 | 8.3 | 26.9 | 99.7 |
| 15 | Stewart-Warner | 95.7 | 95.8 | Const. level | 4 3/64 | 5 3/64 | 11.1 | 26.5 | 98.3 |
| 16 | Taco Siphon | 92.4 | 94.0 | 85.9 | 2 3/64 | 3 3/64 | 5.8 | 27.0 | 99.8 |
| 17 | Eiderdown (closed) | 99.4 | 99.5 | | 2 3/64 | 2 3/64 | 5.6 | 27.2 | 100.7 |
| 17′ | Eiderdown (open) | Test n | ot run | | | | 4.8 | 27.0 | 99.9 |
| 18 | United (collector) | 73.3 | 72.5 | | 9 | 9 | 12.7 | 26.5 | 98.2 |
| 19 | United (ejector) | 62.2 | 58.3 | | 3 1/64 | 4 1/32 | 9.3 | 27.0 | 99.8 |
| 20 | Pomona | 98.4 | 98.2 | | 2 1/64 | 2 3/64 | 7.2 | 26.7 | 98.8 |
| 21 | Pomona | 98.8 | 98.6 | | 2 3/64 | 2 3/64 | 5.3 | 27.5 | 102.0 |
| 22 | Pomona | 97.4 | 97.1 | | 1 3/64 | 1 1/32 | 4.8 | 26.6 | 98.3 |
| 23 | Bennett | 42.7 | 37.6 | | 5 1/64 | 6 1/64 | 8.9 | 26.6 | 98.2 |
| 24 | Samson | 95.9 | 95.2 | Not run | 5 3/64 | 5 3/64 | 10.1 | 27.0 | 100.1 |
| 24A | Samson | | | | | | 6.9 | 26.8 | 99.1 |
| 25 | Stromberg | 88.5 | 87.4 | | 4 3/64 | 6 3/64 | 11.1 | 26.5 | 98.3 |
| 25A | Stromberg | | | | | | 8.8 | 26.4 | 97.6 |
| 25B | Stromberg | | | | | | 7.0 | 27.2 | 100.6 |
| 26 | Dailey | 99.7 | 99.6 | | 8 1/64 | 9 | 17.4* | 26 7 | 98.9 |
| 27 | Bennett | | | | | | 9.3 | 26.8 | 99.1 |

*Abnormal; chaff of chaff test not all out

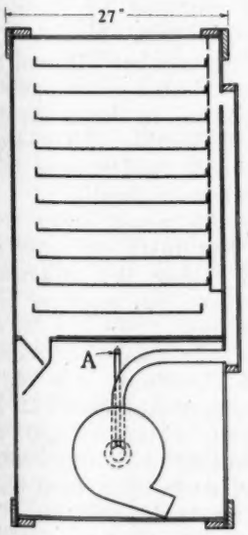



*Fig. 1—Sectional view of device for air-floating soil to obtain the standard dust*

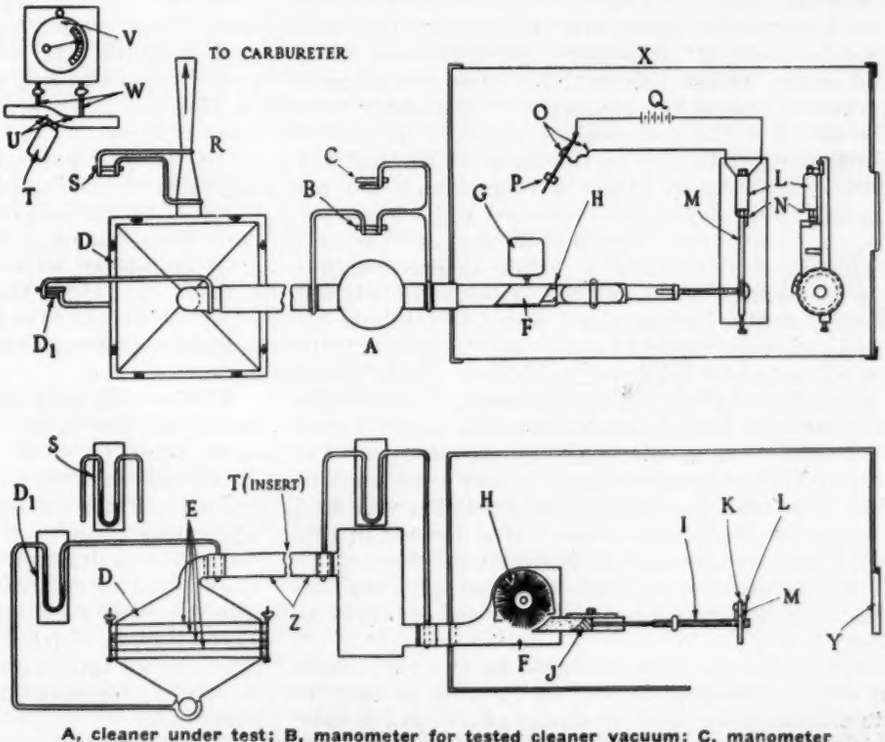



*Fig. 2—General layout of apparatus for tests of air-cleaning efficiency and of vacuum*

A, cleaner under test; B, manometer for tested cleaner vacuum; C, manometer for tested inlet vacuum; D, absolute cleaner; $D_1$, absolute cleaner manometer; E, eiderdown blanketing; F, dust feeding device; G, slow-speed motor; H, bristle brush wheel revolved by motor; I, dust feed screw (pitches used—10, 20, 28 per in.); J, dust feed plunger; K, ratchet wheel (92 teeth); L, electromagnet; M, pawl; N, armature; O, electrical contacts; P, pendulum of adjustable period; Q, storage battery, 32 volt; R, air meter; S, air meter manometer; T, water and sand trap; U, baffles; V, hygrometer; W, bypass tubes; X, cage for dust feeding device; Y, screen for eiderdown blanketing; Z, radiator hose for connections

evaporation in the case of the water type. The method actually used consisted in catching the dust that was passed by the cleaner on accurately weighable material. This device, B, Fig. 2, referred to as the absolute cleaner, consisted of two to six squares of eiderdown blanketing stretched on 18-in. square wooden frames, nap side up, the frames being solidly clamped between an upper and a lower sheet metal pyramid. Not all of the dust remaining in the air after passing through the cleaner under test was caught by this "absolute cleaner," but the remnant was usually less than 1 per cent and was allowed for by a correction applied to the result. This correction was based on the theory that all of the dust would have been caught if the air had been passed through an infinite number of cloths instead of only four. In most cases the proportion of the dust caught by the first cloth amounted to more than 90 per cent of the whole, and the correction usually was equal to about one-half the dust caught on the last cloth. What small quantities had to be dealt with may be appreciated when it is stated that some of the cleaners passed less than 1 per cent of the dust fed to them, and of this, less than 1 per cent was passed by the absolute cleaner.

### Eliminating Errors

Both the eiderdown cloth and the dust are highly hygroscopic, and in order to eliminate errors due to water absorbed it was necessary to dry thoroughly the cloths before weighing. This was done in an Emerson textile conditioning oven, for 2 hr. or more, at about 230 deg. Fahr. The moisture absorbed from the air by the cloth and driven off in the oven in many cases weighed more than ten times as much as the dust collected. Each cloth was weighed separately in the oven.

The efficiency tests were made on a Weidely four-cylinder 3¾ by 5½-in. tractor engine. At least three test runs were made with each cleaner at the normal engine speed of 1200 r.p.m. One was a full-load run (about 20.6 hp.), another a light-load run (12.6 hp.), and the third a service-condition run, the features of which were variable load, variable speed, quick pick-up, idling and back-firing. In addition to these three, special tests were given to some of the cleaners. A low-water level test was given to the so-called air-washers, the object being sufficiently indicated by the name of the test. A "chaff test" was run on those cleaners which did not have the air intake sufficiently screened and whose construction was such that there was danger of vegetable refuse choking the cleaner to a certain extent and thus affecting the vacuum at the carbureter inlet. In this test 10 grams of air-dry wheat chaff was fed into the air stream and vacuum readings were then taken. A "fill-up" test was made to determine the ability of the cleaners to work under gross neglect or abuse. The results obtained from this test are not regarded as exact, but as giving a general idea of what might be expected from the cleaner if it had no attention until it was filled up with dirt. For this last test the No. 2 standard dust was used and was fed at a quite rapid rate. If a cleaner in this test took five or more pounds of dust without showing an appreciable increase in vacuum produced or a marked decrease in dust-separating efficiency it was regarded as fool-proof.

Readings of the vacuum produced at the carbureter inlet by the dust-feeding device, the air cleaner and the absolute cleaner were made by means of an open U-tube containing distilled water. Power tests to determine the effect of the air cleaners on the maximum output were made on a Sprague electric dynamometer, and in order to eliminate the effect of changes with time, three successive tests were always made, with cleaner off, with cleaner on, and then immediately with cleaner off again. The maximum obtainable horsepower with cleaner on was then divided by the average of the two results with the cleaner off. All cleaners which had been in the dust-separation efficiency tests were thoroughly cleaned out before the power tests, except the Dailey cleaner No. 26, from which it is believed not all the chaff from the chaff test had been washed out, with the result that it produced an unreasonably high vacuum, much higher than was indicated in another test with about the same power output.

### Variation in Power

A run was made to determine the variation in power output with the vacuum at the carbureter inlet. After the maximum power had been obtained with the engine well warmed up and the carbureter inlet unobstructed, a 1¼-in. pipe nipple containing a piezometer ring for attachment to the manometer tube was connected to the air inlet by a short length of radiator hose and a 1¾-in. gate valve was connected to the nipple. Readings were then taken simultaneously of the vacuum and the power output. Graphs are given in the report showing how the amount of dust entering affects the vacuum due to the cleaner, and from these and the graph showing the relation between the vacuum at the carbureter intake and the engine horsepower the output reduction with a moderate amount of dust in the cleaner can be predicted.

Invitations were sent to manufacturers of cleaners to submit samples for the tests, and all but one of those approached availed themselves of the opportunity. They were furnished with details of the engine and asked to supply a cleaner of the proper size. Thirty cleaners were tested, ten of these being of the dry type, eleven of the water type and nine of the oil type, thus providing a good variety.

### Results Are Interesting

Of the ten dry type cleaners two (13 and 17) used cloth filters, while the other eight employed the centrifugal principle, the whirl being obtained by means of vanes, tangentially placed inlets, or both (Nos. 6, 7, 23, 25, 25A and 25B), or by a rotating member (18 and 19). Some of these (25, 25A and 25B) had an ejector, operated by the exhaust gases from the engine, to throw the dust separated to the outside air, while another (19), ejected the dust by the centrifugal action of the rotating member. These cleaners did not need to be emptied.

Of the eleven water type cleaners tested, seven (Nos. 1, 2, 10, 11, 14, 24, 24A) passed the dusty air under the edges of a float, two (8 and 27) used the centrifugal principle, and two (15 and 16) used the atomizer principle.

Of the nine oil cleaners, one (12) used the atomizer principle; the other eight had oil filters, one (9) of cloth, three (3, 4, 26) of fibrous material, two (21, 22) of fibrous material combined with oil centrifugal, and one (5) of fibrous material combined with dry centrifugal. One cleaner (No. 17) was made by a local blacksmith from a drawing published in a trade journal. Two thicknesses of eiderdown blanketing were wrapped, nap side out, over a cylinder of ½-in. mesh hardware cloth. This cleaner, which had been described as an obsolete type, proved satisfactory under all conditions. No cover is said to be necessary, and it can be placed in any position.

In Table 1 herewith are given some general data of the cleaners tested, while Table 2 is a summary of the test results.

These present in brief form the most important points brought out by the tests.

## Lubrication of Racing Engines

*Editor,* AUTOMOTIVE INDUSTRIES:

Permit me to comment on certain statements under the title, "Lubrication of Racing Engines," appearing on page 139 of the July 19th issue of AUTOMOTIVE INDUSTRIES. In the last paragraph certain suggestions are set forth as a means of increasing the effectiveness of the oiling system.

Perhaps you do not mean to imply that the oil pressure actually sustains the bearing pressure. When we consider bearing loads around 1000 lb. per sq. in. with maximum oil pressures in the bearing of at least twice this amount, it is obvious that increasing the oil pressure can be effective only in circulating more oil. Allow me to direct your attention to my article on "Crank-pin Bearing Design," which appeared in AUTOMOTIVE INDUSTRIES March 1, 8 and 15, 1923. In these articles, the problems to which you refer were quite fully discussed, and the next to the last paragraph on page 626 in the issue of March 15 contains some suggestions which may be applied with satisfactory results.

You state in the last sentence of your editorial that should all of these remedies prove inadequate, the only course that remains open is to increase the sizes of the bearings. I trust you mean an increase in the effective projected bearing area for the purpose of reducing the average unit load. This might be taken to mean an increase in the diameter of the bearing which cannot help, since the rubbing velocity of the bearing becomes greater with this change and consequently the amount of heat generated due to friction.

G. D. ANGLE.

We agree that the pressure of the oil feed is not the pressure that sustains the crankshaft, but experiment has shown that, within certain limits at least, an increased oil feed pressure will permit of a higher load being carried per square inch of projected bearing surface. This may be due to the fact that a higher feed pressure induces a higher rate of circulation and thus tends to carry off the heat generated more rapidly.

When it is desired to reduce the heating of the bearing by an increase in the effective area of the bearing, it is generally the best plan to secure the increased area by lengthening the bearing. However, with crankshafts having a comparatively small number of supporting bearings it is sometimes possible to reduce the heating by increasing the diameter. Theoretically the bearing losses would increase in the same ratio as the radiating area, but in practice the bearing loss depends to quite an extent upon the distortion of the crankshaft and this will naturally be less with a crank of larger diameter.

There is one other remedy for bearing trouble besides those mentioned in our editorial, and that is the adoption of anti-friction bearings on the crank. Quite a number of racing engines have been fitted with such bearings on both the crank pins and the main journals, and it was undoubtedly the difficulty of providing sufficient bearing area for plain bearings in an engine which must necessarily be of the most compact and the lightest design that induced the designers to adopt ball and roller bearings.—Editor.

## Study of Braking Encouraged

*Editor,* AUTOMOTIVE INDUSTRIES:

I think the editorial on better brake design in your issue of July 12 is a good one, summing up, as it does, the various phases and opinions on the subject of brakes. As I see it, the chief function of an editorial is to get its readers to thinking and to direct, insofar as possible, their thinking along constructive lines.

This particular editorial should, I believe, encourage both two-wheel and four-wheel brake development, and that is the best sort of condition to make the ultimate outcome the right one.

Just as in all constructions there are advantages and disadvantages from mechanical, commercial and owner viewpoints in each system, and I personally think that each of the two types of brakes has its sphere, the principal determining factor being, as I see it, the type of operation aimed at.

I must say, however, that I have never been able to get very enthusiastic over the propeller shaft type of brake—in fact, I have never been willing to use it in production.

Neither do I believe, as the editorial infers some people do, that by the mere expenditure of more money, two-wheel brakes could be made to duplicate the action of four-wheel brakes any more than I believe that the four-wheel brakes can be made satisfactory except with considerably more rigging than would be required with two-wheel brakes.

J. G. VINCENT, Vice-President of Engineering,
Packard Motor Car Company.

*Editor,* AUTOMOTIVE INDUSTRIES:

I am in general in hearty accord with the ideas expressed in the editorial in your issue of July 12, entitled "Better Brake Design and Construction Should Result from Current Discussion," referring to the four-wheel brake situation. The last paragraph sums up the matter very clearly.

There is no question that brake design and construction, in this country, have lagged far behind the meritorious work done on other car units. There have been far too many cars with only one serviceable brake, the second being quite incapable of holding the car with any real efficiency. Even the better brake of the two frequently requires day to day adjustment to keep it up to capacity. This adjustment is often difficult to make and is therefore frequently neglected.

Personally, I would rather see the industry correct these faults before jumping to the four-wheel brake. The latter type involves difficulties and complications, as was well brought out at the S. A. E. Summer Meeting, that can only be worked out by long consideration and very complete tests. The fundamental design of the brake rigging on each axle must be far better than has been the case in the past to allow of the complete job being even a partial success.

HENRY M. CRANE.

# Exports of Cars, Trucks and Tires for

| COUNTRIES | GASOLINE PASSENGER CARS | | | | | | | | GASOLINE TRUCKS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Up to $500 | | $500 to $800 | | $800 to $2000 | | Over $2000 | | Up to 1 ton incl. | | 1 to 2½ tons | | Over 2½ tons | |
| | No. | Value | No. | Value | No. | Value | No. | Value | No. | Value | No. | Value | No. | Value |
| **Europe** | | | | | | | | | | | | | | |
| Austria | | | | | | | | | | | | | | |
| Azores and Madeira Islands | 1 | $500 | | | | | | | | | | | | |
| Belgium | 499 | 160,846 | 22 | $16,572 | 68 | $74,548 | 22 | $59,104 | 578 | $145,773 | 2 | $1,062 | | |
| Czechoslavakia | | | 1 | 550 | | | | | | | | | | |
| Denmark | 62 | 27,384 | 110 | 71,457 | 63 | 62,719 | 4 | 14,615 | 4 | 2,124 | | | | |
| Esthonia | | | | | 6 | 6,244 | | | | | | | | |
| Finland | 28 | 11,427 | | | 8 | 7,436 | | | | | | | | |
| France | | | 1 | 657 | 2 | 3,000 | 5 | 12,668 | | | | | | |
| Germany | 3 | 1,425 | | | 5 | 6,190 | 1 | 5,000 | | | | | | |
| Gibraltar | | | | | 2 | 2,873 | | | | | | | | |
| Greece | 8 | 3,536 | 11 | 8,305 | 5 | 5,169 | 2 | 4,032 | | | | | | |
| Hungary | 1 | 493 | | | 4 | 4,574 | 1 | 2,466 | | | | | | |
| Iceland and Faroe Islands | | | | | 1 | 1,423 | | | | | | | | |
| Italy | 278 | 73,271 | 1 | 800 | 1 | 1,939 | | | 15 | 3,613 | | | | |
| Latvia | | | | | 7 | 6,783 | | | | | | | | |
| Lithuania | | | | | 1 | 812 | | | | | | | | |
| Malta Gozo and Cyprus | 6 | 2,958 | 2 | 1,100 | 1 | 879 | | | | | | | | |
| Netherlands | 71 | 39,027 | 80 | 51,606 | 148 | 139,930 | 5 | 13,044 | 22 | 7,990 | | | | |
| Norway | 250 | 85,487 | 37 | 24,672 | 63 | 60,956 | 1 | 2,465 | | | 4 | 5,362 | | |
| Poland and Danzig | 3 | 1,413 | 2 | 1,514 | 5 | 5,133 | | | | | | | | |
| Portugal | 16 | 6,641 | 4 | 2,934 | 62 | 71,348 | | | 1 | 450 | | | | |
| Rumania | 1 | 493 | | | 14 | 15,749 | 1 | 2,466 | | | | | | |
| Russia | | | | | | | | | 1 | 500 | | | 1 | $4,441 |
| Spain | 174 | 77,185 | 140 | 94,122 | 333 | 373,068 | 23 | 57,469 | 3 | 1,176 | 6 | 5,695 | | |
| Sweden | 510 | 175,997 | 56 | 40,828 | 72 | 82,038 | 3 | 6,583 | 402 | 102,874 | 6 | 5,575 | | |
| Switzerland | 20 | 9,374 | | | 24 | 27,697 | 7 | 17,746 | | | | | | |
| Turkey | | | | | | | | | | | | | | |
| Ukraine | | | | | | | 9 | 7,147 | 20 | 7,280 | | | | |
| England | 536 | 218,047 | 179 | 123,234 | 177 | 176,349 | 10 | 45,362 | 8 | 2,751 | 42 | 46,248 | 9 | 10,990 |
| Scotland | 1 | 463 | 4 | 2,880 | 3 | 4,850 | | | | | | | | |
| Ireland | 1 | 300 | 69 | 50,103 | | | | | | | | | | |
| Yugoslavia Albania and Fiume | 29 | 9,320 | | | | | | | | | | | | |
| **North and South America** | | | | | | | | | | | | | | |
| United States | | | | | | | | | | | | | | |
| Canada | 196 | 59,553 | 313 | 207,090 | 658 | 609,519 | 74 | 208,677 | 44 | 33,506 | 76 | 104,768 | 20 | 44,942 |
| British Honduras | | | | | | | | | | | | | | |
| Costa Rica | | | 2 | 1,540 | 3 | 3,025 | | | | | | | | |
| Guatemala | 4 | 1,440 | | | 7 | 7,224 | | | | | | | | |
| Honduras | 6 | 1,854 | | | 1 | 812 | | | 1 | 360 | | | | |
| Nicaragua | 1 | 200 | | | | | | | | | | | | |
| Panama | 19 | 7,823 | 3 | 1,823 | 5 | 5,413 | | | 6 | 1,820 | | | | |
| Salvador | | | | | 6 | 7,246 | 1 | 2,100 | | | | | | |
| Mexico | 487 | 177,411 | 124 | 80,347 | 180 | 175,766 | 8 | 20,783 | 80 | 39,601 | 9 | 6,730 | 4 | 3,700 |
| Newfoundland and Labrador | 8 | 3,348 | 1 | 787 | 10 | 11,735 | | | | | | | | |
| Barbados | 7 | 2,556 | | | 6 | 5,594 | | | | | 1 | 1,802 | | |
| Jamaica | 13 | 4,939 | 2 | 1,345 | 6 | 5,817 | | | 17 | 7,029 | 1 | 2,311 | | |
| Trinidad and Tobago | 23 | 7,914 | | | 4 | 4,019 | | | 8 | 2,912 | | | | |
| Other British West Indies | 16 | 6,903 | 1 | 800 | 2 | 1,927 | | | 1 | 364 | | | | |
| Cuba | 202 | 49,869 | 19 | 14,397 | 43 | 45,430 | 10 | 30,844 | 12 | 4,302 | 9 | 18,454 | 1 | 4,000 |
| Dominican Republic | 45 | 16,809 | 5 | 3,815 | 6 | 7,085 | 2 | 4,570 | 3 | 2,228 | 1 | 879 | | |
| Dutch West Indies | 4 | 1,363 | | | 1 | 1,000 | | | 2 | 728 | | | | |
| French West Indies | | | | | 11 | 9,810 | | | | | | | | |
| Haiti | | | 4 | 3,072 | 3 | 3,050 | | | | | | | | |
| Virgin Islands | 2 | 793 | | | 1 | 1,423 | | | | | | | | |
| Argentina | 201 | 91,249 | 29 | 21,233 | 177 | 180,191 | 16 | 48,171 | | | 2 | 3,288 | | |
| Bolivia | | | | | 8 | 10,195 | 1 | 2,308 | | | | | | |
| Brazil | 8 | 3,450 | 24 | 18,010 | 110 | 110,365 | 8 | 19,914 | | | | | | |
| Chile | 49 | 15,188 | 6 | 3,800 | 33 | 35,147 | 1 | 2,500 | 78 | 28,208 | | | | |
| Columbia | 8 | 2,733 | 1 | 548 | 10 | 10,402 | 1 | 2,600 | 8 | 2,672 | | | | |
| Ecuador | 10 | 3,753 | 2 | 1,514 | 4 | 5,745 | | | 18 | 6,552 | 1 | 1,500 | | |
| British Guiana | 10 | 3,609 | | | 1 | 1,113 | | | | | | | | |
| Dutch Guiana | 2 | 950 | | | | | | | | | | | | |
| French Guiana | | | | | | | | | 1 | 304 | | | | |
| Peru | 9 | 3,467 | 1 | 677 | 8 | 8,030 | 2 | 5,708 | 14 | 5,339 | 2 | 2,440 | | |
| Uruguay | 70 | 18,358 | 11 | 6,484 | 32 | 40,798 | 11 | 36,977 | 50 | 12,782 | | | | |
| Venezuela | 41 | 16,958 | 6 | 4,772 | 25 | 26,223 | 6 | 15,792 | 1 | 364 | | | | |
| **Asia** | | | | | | | | | | | | | | |
| Aden | | | | | | | | | | | | | | |
| British India | 43 | 19,170 | 85 | 52,827 | 36 | 35,007 | | | 6 | 4,324 | 4 | 4,847 | | |
| Ceylon | 13 | 4,953 | | | 4 | 3,628 | | | | | 3 | 4,740 | | |
| Straits Settlements | 42 | 20,221 | 19 | 11,505 | 48 | 49,687 | | | | | | | | |
| Other British East Indies | | | | | | | | | | | | | | |
| China | 8 | 3,027 | | | 23 | 23,892 | | | 20 | 7,280 | | | | |
| Chosen | | | | | 2 | 2,326 | | | | | | | | |
| Java and Madura | 48 | 21,550 | 36 | 26,721 | 57 | 60,180 | 2 | 7,150 | | | | | | |
| Other Dutch East Indies | | | 6 | 4,579 | 2 | 1,836 | | | | | | | | |
| French Indo-China | | | 6 | 4,745 | | | | | | | | | | |
| Hejaz Arabia and Mesopotamia | 1 | 463 | | | | | | | | | | | | |
| Hongkong | | | | | 12 | 11,805 | | | 4 | 1,680 | 1 | 1,822 | | |
| Japan | 145 | 47,811 | 46 | 29,209 | 73 | 81,567 | 2 | 6,100 | 185 | 61,278 | 4 | 7,894 | 4 | 9,811 |
| Kwantung | | | | | | | | | | | | | | |
| Palestine and Syria | 101 | 31,126 | 3 | 2,353 | 22 | 23,919 | 1 | 3,000 | | | | | | |
| Persia | | | 1 | 525 | | | | | | | | | | |
| Philippine Islands | 114 | 44,225 | 28 | 20,890 | 46 | 47,740 | 2 | 5,900 | 20 | 7,000 | | | | |
| Siam | | | 3 | 2,272 | 6 | 5,314 | | | | | | | | |
| Turkey | 1 | 300 | | | | | | | | | | | | |
| **Oceania** | | | | | | | | | | | | | | |
| Australia | 480 | 203,713 | 1,011 | 659,866 | 1,013 | 1,132,928 | 39 | 90,997 | 49 | 52,528 | 119 | 136,638 | 39 | 65,316 |
| British Oceania | | | | | | | | | 1 | 372 | | | | |
| French Oceania | | | 1 | 650 | | | | | 1 | 360 | | | | |
| New Zealand | 187 | 60,184 | 73 | 54,589 | 188 | 197,778 | 8 | 19,628 | 17 | 21,377 | 20 | 22,474 | 2 | 4,435 |
| Other Oceania | | | | | | | | | | | | | | |
| **Africa** | | | | | | | | | | | | | | |
| Belgian Congo | 2 | 950 | | | | | | | | | | | | |
| British West Africa | 1 | 300 | | | 2 | 1,844 | | | 24 | 24,369 | | | | |
| British South Africa | 90 | 41,588 | 60 | 41,105 | 208 | 203,263 | 3 | 7,116 | 2 | 1,514 | 1 | 1,172 | | |
| British East Africa | 13 | 5,304 | | | 7 | 6,370 | | | | | | | | |
| Canary Islands | 13 | 6,035 | 2 | 1,490 | 9 | 10,203 | | | | | 2 | 1,755 | | |
| Egypt | 23 | 10,739 | | | | | 1 | 2,077 | | | | | | |
| Algeria and Tunis | 10 | 3,217 | | | | | | | | | | | | |
| Other French Africa | 2 | 728 | | | | | | | 2 | 728 | | | | |
| Morocco | | | 2 | 1,092 | | | | | | | | | | |
| Portuguese East Africa | | | | | | | | | | | | | | |
| Other Portuguese Africa | 2 | 725 | 8 | 6,058 | 4 | 4,001 | | | 4 | 1,500 | | | | |
| Spanish Africa | 3 | 1,479 | | | | | | | | | | | | |
| Other Countries | | | | | | | | | | | | | | |
| **Total** | 5,231 | $1,925,885 | 2,672 | $1,783,864 | 4,198 | $4,469,099 | 286 | $792,979 | 1,733 | $67,915 | 316 | $387,456 | 80 | $147,665 |

# June, 1923 — Canadian Exports

| ELECTRIC VEHICLES | | PARTS | TIRES | | | | | | PASSENGER CARS | | TRUCKS | | PARTS | COUNTRIES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Casings | | Salid | | Inner | | | | | | | |
| No. | Value | Value | No. | Value | No. | Value | No. | Value | No. | Value | No. | Value | Value | |
| | | | 198 | $2,875 | | | 70 | $141 | | | | | | Europe |
| | | $54 | | | | | | | | | | | | Austria |
| | | 185,400 | 206 | 3,111 | | | 391 | 536 | 21 | $18,322 | 1 | $751 | $447 | Azores and Madeira Islands |
| | | 212 | 290 | 4,972 | | | | | | | | | | Belgium |
| | | 391,970 | 905 | 13,305 | 2 | $95 | 508 | 944 | 9 | 7,007 | | | 410 | Czechoslovakia |
| | | | 224 | 3,089 | | | 204 | 361 | 1 | 1,002 | | | | Denmark |
| | | 1,565 | 378 | 5,124 | 16 | 316 | 386 | 672 | | | | | | Esthonia |
| | | 122,992 | 640 | 9,321 | 36 | 1,406 | 260 | 569 | | | | | | Finland |
| | | 15 | 1,346 | 20,793 | 20 | 509 | 1,389 | 2,829 | | | | | | France |
| | | 61 | | | | | | | | | | | | Germany |
| | | 2,926 | 967 | 14,026 | 81 | 3,546 | 1,282 | 2,478 | | | | | | Gibraltar |
| | | 11 | 250 | 3,555 | | | 256 | 337 | 2 | 1,828 | | | | Greece |
| | | 198 | 14 | 165 | | | 15 | 25 | | | | | | Hungary |
| | | 9,360 | 2,002 | 24,924 | | | 997 | 1,830 | 2 | 2,188 | | | | Iceland and Faroe Islands |
| | | 43 | 94 | 1,245 | | | 240 | 453 | | | | | | Italy |
| | | | 200 | 2,308 | | | 400 | 639 | | | | | | Latvia |
| | | 612 | | | | | | | | | | | | Lithuania |
| | | 22,153 | 1,234 | 17,551 | 56 | 1,972 | 1,366 | 2,020 | 14 | 16,510 | | | 52 | Malta, Gozo and Cyprus |
| | | 15,835 | 372 | 3,778 | 64 | 3,384 | 525 | 1,482 | 2 | 2,496 | | | 528 | Netherlands |
| | | 116 | 112 | 1,035 | | | 302 | 530 | | | | | | Norway |
| | | 11,684 | 587 | 6,564 | | | 282 | 479 | 3 | 3,902 | | | | Poland and Danzig |
| | | 1,174 | | | | | | | | | | | | Portugal |
| | | 260 | | | | | | | | | | | | Rumania |
| | | 181,107 | 1,839 | 28,977 | 206 | 4,811 | 1,738 | 3,034 | 16 | 25,240 | | | 6,505 | Russia |
| 3 | $5,711 | 25,778 | 8,925 | 110,055 | 55 | 1,465 | 6,002 | 9,609 | 46 | 49,138 | | | 507 | Spain |
| | | 2,206 | 767 | 10,978 | | | 678 | 1,541 | 8 | 3,421 | | | 175 | Sweden |
| | | 984 | 125 | 1,706 | 12 | 415 | 95 | 168 | | | | | 512 | Switzerland |
| | | 1,178 | 25 | 734 | | | 40 | 117 | | | | | | Turkey |
| | | 450,771 | 45,055 | 380,231 | 2,456 | 46,793 | 31,445 | 41,845 | 465 | 259,940 | 33 | 24,697 | 72,054 | Ukraine |
| | | 59 | 62 | 1,435 | | | 47 | 136 | | | | | | England |
| | | 79,889 | 1,409 | 13,593 | | | 1,283 | 1,800 | | | | | | Scotland |
| | | | | | | | | | | | | | | Ireland |
| | | | | | | | | | | | | | | Yugoslavia, Albania and Fiume |
| | | | | | | | | | 14 | 5,195 | 1 | 175 | 83,134 | North and South America |
| 1 | 1,950 | 1,714,551 | 11,526 | 134,199 | 569 | 5,412 | 4,306 | 9,486 | | | | | | United States |
| | | 97 | 31 | 189 | | | 24 | 50 | | | | | | Canada |
| | | 469 | 14 | 177 | 2 | 78 | 8 | 20 | | | | | | British Honduras |
| | | 2,205 | 97 | 1,748 | | | 257 | 437 | | | | | | Costa Rica |
| | | 2,971 | 52 | 1,923 | 40 | 1,599 | 34 | 101 | | | | | | Guatemala |
| | | 198 | 39 | 648 | | | 89 | 158 | | | | | | Honduras |
| | | 9,748 | 298 | 3,702 | 32 | 1,034 | 562 | 917 | | | | | | Nicaragua |
| | | 3,217 | 14 | 280 | | | 12 | 39 | | | | | | Panama |
| 4 | 7,454 | 108,315 | 6,629 | 73,377 | 71 | 1,935 | 4,111 | 8,606 | 9 | 10,056 | | | 38 | Salvador |
| | | 1,827 | 180 | 3,159 | | | 243 | 422 | 12 | 4,541 | | | 317 | Mexico |
| | | 3,006 | 29 | 280 | | | 44 | 125 | | | | | | Newfoundland and Labrador |
| | | 18,685 | 623 | 7,991 | 36 | 450 | 1,227 | 1,916 | | | | | | Barbados |
| | | 9,183 | 632 | 8,279 | 20 | 499 | 1,120 | 1,871 | | | | | | Jamaica |
| | | 2,106 | 126 | 1,711 | | | 369 | 653 | 15 | 8,400 | | | 449 | Trinidad and Tobago |
| | | 96,721 | 4,930 | 57,225 | 282 | 7,529 | 10,959 | 17,632 | 4 | 5,156 | | | 45 | Other British West Indies |
| | | 7,147 | 540 | 5,538 | 37 | 1,224 | 620 | 1,979 | | | | | | Cuba |
| | | 991 | 33 | 322 | | | 107 | 173 | | | | | | Dominican Republic |
| | | 1,380 | 272 | 2,791 | 8 | 155 | 15 | 16 | | | | | | Dutch West Indies |
| | | 3,303 | 94 | 1,188 | | | 252 | 458 | | | | | | French West Indies |
| | | 610 | 28 | 445 | | | 36 | 59 | | | | | | Haiti |
| | | 219,562 | 8,900 | 91,635 | 172 | 5,397 | 5,476 | 12,801 | 84 | 52,448 | | | 5,486 | Virgin Islands |
| | | 2,869 | 60 | 1,300 | | | 60 | 149 | | | | | 186 | Argentina |
| | | 329,374 | 1,892 | 20,564 | | | 2,316 | 5,078 | 3 | 4,041 | | | 10,445 | Bolivia |
| | | 22,473 | 796 | 10,435 | 10 | 546 | 1,224 | 2,589 | 7 | 9,194 | | | | Brazil |
| | | 10,417 | 732 | 11,792 | 80 | 1,340 | 935 | 1,728 | 2 | 2,716 | | | 295 | Chile |
| | | 923 | 228 | 3,228 | | | 168 | 332 | | | | | 10 | Colombia |
| | | 1,378 | 40 | 542 | | | 24 | 37 | 3 | 1,391 | | | 127 | Ecuador |
| | | 88 | 26 | 270 | | | 28 | 47 | | | | | | British Guiana |
| | | 102 | | | | | | | | | | | | Dutch Guiana |
| | | 23,817 | 1,402 | 19,362 | 92 | 1,687 | 1,145 | 2,338 | | | | | | French Guiana |
| | | 13,809 | 1,787 | 16,636 | 8 | 494 | 1,121 | 1,722 | 14 | 15,709 | | | 965 | Peru |
| | | 18,773 | 1,052 | 13,550 | 21 | 448 | 975 | 2,056 | 1 | 1,009 | | | 70 | Uruguay |
| | | | | | | | | | | | | | | Venezuela |
| | | 196 | 195 | 1,550 | | | 98 | 137 | 5 | 1,442 | 3 | 1,002 | | Asia |
| | | 26,136 | 932 | 9,641 | 56 | 3,008 | 412 | 627 | 288 | 122,605 | 61 | 20,374 | 8,853 | Aden |
| | | 454 | 88 | 847 | 4 | 71 | 12 | 27 | 25 | 13,219 | 24 | 8,016 | 5,001 | British India |
| | | 36,139 | 2,841 | 24,173 | 155 | 3,236 | 1,299 | 1,637 | 138 | 51,769 | 12 | 4,008 | 17,693 | Ceylon |
| | | 204 | | | | | | | | | | | | Straits Settlements |
| | | 14,498 | 438 | 7,260 | | | 251 | 425 | 19 | 16,336 | | | | Other British East Indies |
| | | 145 | 48 | 830 | | | 40 | 32 | | | | | | China |
| | | 14,183 | 1,156 | 15,718 | 67 | 3,098 | 1,022 | 1,896 | | | | | | Chosen |
| | | 2,865 | 68 | 781 | 12 | 329 | 77 | 140 | 121 | 68,958 | | | 5,920 | Java and Madura |
| | | 1,382 | | | | | | | | | | | | Other Dutch East Indies |
| | | 976 | 169 | 1,540 | | | 36 | 81 | | | | | | French Indo-China |
| | | 1,720 | 645 | 13,019 | 74 | 2,108 | 516 | 966 | | | | | | Hejaz Arabia and Mesopotamia |
| 3 | 205 | 88,360 | 1,802 | 17,445 | 782 | 12,394 | | | 15 | 10,269 | | | | Hongkong |
| | | 3,720 | | | | | | | | | | | | Japan |
| | | 9,525 | 521 | 6,407 | 2 | 49 | 514 | 2,367 | | | | | 269 | Kwantung |
| | | | | | | | | | | | | | | Palestine and Syria |
| | | 16,617 | 3,193 | 45,360 | 475 | 9,465 | 3,576 | 5,601 | | | | | | Persia |
| | | 320 | 40 | 460 | | | 40 | 57 | 3 | 1,300 | | | 50 | Philippine Islands |
| | | | | | | | | | | | | | | Siam |
| | | | | | | | | | | | | | | Turkey |
| | | 225,898 | 9,011 | 127,203 | 1,531 | 38,852 | 4,676 | 9,430 | 1,548 | 685,703 | 705 | 240,471 | 83,957 | Oceania |
| | | 583 | 4 | 39 | | | | | 6 | 2,396 | | | 69 | Australia |
| | | 667 | 44 | 586 | 9 | 370 | 51 | 94 | | | | | | British Oceania |
| | | 34,761 | 7,216 | 104,091 | 587 | 16,902 | 1,981 | 3,862 | 980 | 409,206 | 138 | 46,092 | 60,405 | French Oceania |
| | | 718 | 122 | 1,591 | | | 127 | 231 | | | | | | New Zealand |
| | | | | | | | | | | | | | | Other Oceania |
| | | 160 | | | | | | | | | | | | Africa |
| | | 12,263 | 174 | 2,827 | | | 24 | 138 | 44 | 12,215 | | | 2,779 | Belgian Congo |
| | | 39,503 | 3,760 | 38,904 | 47 | 1,192 | 5,628 | 9,731 | 641 | 241,554 | 134 | 45,148 | 51,254 | British West Africa |
| | | 1,635 | 134 | 1,512 | | | 30 | 45 | 37 | 14,712 | 7 | 2,338 | 1,533 | British South Africa |
| | | 6,504 | 255 | 2,951 | 2 | 73 | 130 | 206 | | | | | | British East Africa |
| | | 3,602 | 213 | 2,761 | | | 248 | 582 | | | | | 18 | Canary Islands |
| | | 2,272 | 116 | 953 | 18 | 510 | 601 | 1,501 | | | | | | Egypt |
| | | 3,158 | | | | | | | | | | | | Algeria and Tunis |
| | | 1,839 | 19 | 105 | 5 | 143 | 14 | 102 | | | | | | Other French Africa |
| | | 52 | | | | | | | | | | | | Morocco |
| | | 1,572 | | | 5 | 135 | | | 2 | 1,808 | | | | Portuguese East Africa |
| | | 125 | 24 | 1,560 | | | 10 | 46 | | | | | | Other Portuguese Africa |
| | | | | | | | | | 10 | 6,116 | 1 | 455 | 994 | Spanish Africa |
| | | | | | | | | | | | | | | Other Countries |
| 11 | $15,320 | $4,691,770 | 144,556 | $1,610,050 | 8,315 | $186,474 | 109,481 | $188,531 | 4,639 | $2,171,357 | 1,120 | $393,527 | $421,552 | Total |

# Advertising Is a Job for an Expert

## Many comments made with little knowledge; a closer study of audience needed

**The advertising manager of the Planet Motor Car Co., says that it's easy to sell other executives on the same kind of copy every year, but that radical changes meet with disapproval.**

By Harry Tipper

PRESIDENT BILLINGS of the Planet Motor Car Co. and James Chance, the sales manager, were talking more intimately about the proposed year's work with Frank Lane, John Carter, Calvin Farrell and Henry Jones, who occupied the positions of treasurer, vice-president, chief engineer and advertising manager respectively.

The general conference on marketing plans had broken up and the present talk was a more detailed examination of the things brought out in the larger gathering.

"It does seem to me, Lloyd," said John Carter to the president, "that we haven't found the answer to a lot of this publicity work. The arguments are probably right in the main, at least I have a definite feeling that they are, but the plans are much the same old story.

"I can't help thinking that competition is getting keener in this work and that we should be able to get closer to calculating what a certain amount of money will do for us.

"You can't say that our advertising in the past hasn't been successful and when you have found a successful method in the factory you stick to it, don't you?

"Oh! I'm not disturbed about the advertising. It must be a good thing. I notice it helps us, but the point you just brought out is the very thing that bothers me.

"I don't suppose you really know what manufacturing was fifteen years ago in the automobile business in comparison with today. It has changed greatly, not only in its general plan, but in its practice and equipment. Why, we used to take days to do a job that we can finish in hours now.

### Custom Is Strong

"In other words, we are never sure that the method that was succesful last year will be good enough to get us by the sheriff at this time. We do not stick to a method any longer than we can. We will change anything from the location of the superintendent's office to the brand of baking enamel we use if we can gain something worth while by the change. Moreover, we are always looking at everything and examining it with the idea of finding out if it is susceptible to change and improvement. Now you take when Montgomery was talking about that advertising this morning there was very little new thought in the matter.

"I have listened to Monty for ten years discussing the plans of advertising for the Planet Motor Car Co. and I'll lay a bet I can draw the specifications for his next year's speech right now. Yet he is a good advertising man and is well rated in his business."

"I think I know what you mean, John," the president replied, "and in some ways I agree with you. We have made a lot of progress in advertising and when I look at that I think we have done pretty well. But when I realize that the cost of distribution is still going up and that it costs me more to get a certain amount of advertising, I am not so sure. It seems to me, John, that it's a little like your factory in some respects. You have made all kinds of improvements in methods, machinery and equipment, but in general the human side of management is not keeping pace with the other improvements."

"Well!" put in Carter, the advertising manager, "we have made lots of progress in printing, layout, color work, art work and in all the equipment of advertising, just as we have made a good deal of progress in the general aspects of the market. In both ways our information is much better today than it was fifteen years ago. Still we don't know much about why people read one thing and pass up another, why they remember and forget, how they select the contacts they want and what kind of reading matter is of more than the average efficiency with the average audience.

### Individual Copy Needed

"For instance, I admit that the copy we were looking at today is equally applicable to several other automobiles. I admit that I am only hoping that a lot of people will take the trouble to look at it. Experience tells me I am pretty safe in expecting average attention and I am hoping for a little more. It is good copy, however, and much easier to get by this bunch than some real attempts to improve the reading.

"You remember when I showed you that service series 'One Lung Bill' I was jumped on like a ton of coal, squashed, torn to shreds, and it's a wonder my remains weren't fired out of the window without even a decent burial.

"If I can show you some good looking copy here with a picture of the car, some artistic surroundings and all the rest of the mechanical excellence of the commercial art, with perhaps a slogan or a new idea in the art itself, you think it is good and it will pass without a whole lot of argument."

### Cost of Copy High

"You're probably right, Henry," Frank Lane chimed in, "but I don't see how we can afford to spend a lot of money for writing the advertisements in addition to all we have to spend for the space and the printing. When you wanted to print that series about 'One-lung Bill' you were talking about, if I remember rightly it was scheduled to cost us something like $500 for each piece of copy. Of course we spend more than that on the picture sometimes, but we can use those in several different ways, so that it does not mean so much per piece. Good Lord! don't we spend enough money on the publicity without thinking of adding a lot more to it?

In any case, between you and Monty, you should be able to furnish that sort of writing if it is good for the advertising. I didn't think much of it myself; it was too much like newspaper stuff in the semi-humorous vein. It had no dignity and it did not belong to the Planet car."

"I didn't like it either," said James Chance. "I felt that our service manager could have written much better stuff at small cost. He knows his business if ever a man did,

and he could run rings around the man who did write it."

"I think we should have more technical information in our copy," Farrell said. "I believe the public are getting familiar with the general features of the automobile and they want to know more about the real values from an engineering standpoint, told in simple language of course. They keep asking me more questions all the time."

"That's where you're wrong, Cal," Chance came back; "the average car is sold mostly on looks, so long as it will run all right. Looks and local service."

"Now you said something, Jim," Henry Jones replied. "Local service is pretty nearly the keynote; local service and trade reputation cut a lot of figure. Don't you suppose I had that in mind when I projected that service series? You see how it is though. Just as long as I stick to generalities with a slogan, some pictures and a good idea in art, you fellows will not find much to argue about, but just as soon as I try to get interesting you all have a different idea of what is interesting and how the public think and what we should do.

"You don't study it much and yet you are not backward in expressing your opinion. Some day I have a good mind to make up a plan just as I want it and present it to you, take it or leave it. It would be interesting, anyway."

"I think there is something in what Henry says," the president broke in. "I have looked into this advertising matter a number of times, and once I went so far as to write some of the things I thought an advertisement should carry. The stuff I read over afterward convinced me that as a writer I was a good hod carrier. Then I began to suspect that if I couldn't write interesting stuff, I probably couldn't tell what was interesting to the other fellow any better. This summer I have spent a considerable amount of time listening to people, trying to size up just what interested them and why. I'll admit that I got a bit muddled, but I did discover that there were a lot of things about people's interests that I didn't know and I began to think that we were running a neck-and-neck race with our competitors as far as the advertising was concerned.

### Experts Without Knowledge

"Our discussions on this subject remind me of a conversation that I listened to at a country club during lunch. The men with whom I was sitting did not know my business, so that there was no special bar on their conversation. They were talking automobiles, and some of them were speaking about the four-wheel brake. One man in particular was very sure of his ground and talked very definitely about their action. I couldn't help wishing that you were there, Cal, to get the full humor of the thing.

"These men were settling a question they knew practically nothing about, just as they would have done with the railroad business. That's where we are in all these intangible human affairs. I don't like the same book that you do, nor read the same articles with relish, but the editors know that the things that go in the magazine will interest a majority of those that read.

"I wouldn't be surprised, Henry, but that we should take up your suggestion to lay out a plan to suit your ideas of what we should do, present it to us with the full layout and then dare us to pull it to pieces unless we have better things to suggest and they appeal to you.

"Anyway, I am convinced that there is room for a lot of improvement in our program. I agree with John that the plans run to a sameness year after year. You have shown me that it is too difficult to get radical ideas through a conference of this kind and that we are constantly disposing of your ideas without offering any.

"Take your statement of the trade, for example. I think we underrate this trade reputation a good deal. We know we make a good car and we know it has been successful for ten years. We think all the trade know about it, but do they?

"When I think of the number of men who have entered the trade in a year and the few old-timers there are left, I am somewhat disturbed as to how much these men know about the Planet.

### Promotion Work Questioned

"Are we doing the right kind of work in our promotion with the retailer? Maybe that 'One-lung Bill' series was good. Maybe our service manager should write the trade advertising. Maybe we should find out more about what this man in the trade is thinking about. At any rate, we use up a lot of time discussing the interests of a lot of people we have not studied or spent much time thinking about.

"I have a suspicion that you are included in that, Henry, even with your charge against us, and Montgomery also. Planning with a detailed knowledge is just as important in our advertising as it is in the factory and in the engineering department, I guess."

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## New Drill Grinder Developed

OWING to the great difficulty of grinding twist drills properly by hand, there have been placed on the market a number of machines which provide drill points with a variety of surfaces varying from the plain conical surface to the hyperboloid. They differ also in the method used for automatically effecting the motion necessary for grinding. What is most desired, of course, is quick and simple operation together with uniform and accurate results.

Normally all drills are ground with the same lip clearance. However, in view of the ever increasing use of such materials as aluminum and copper alloys, it would seem advisable that twist drills for work on them be provided with cutting edges different from that most suitable for steel. Unfortunately, the correct adjustment of most drill grinders to a certain lip clearance is not a quick and simple matter, and the actual lip clearance on a particular drill cannot be determined with the ordinary measuring apparatus available in the shops. Moreover, only a few drill grinders permit the grinding of drills of less than ⅜ in. diameter, except possibly in connection with special safety provisions.

### An Austrian Product

Friedrich Neumann's Sons, Inc., have recently placed on the American market two drill grinders made in Vienna, Austria, which are claimed to represent a step forward in the direction above outlined. One of them, Model SPK, is for drills of from ⅜ to 2 in. in diameter and the other, Model SPL, for drills smaller than ⅜ in. The provision of separate grinders for small and large drills is justified on grounds of economy and efficiency. In practice the number of small drills to be ground greatly exceeds that of the large drills, and, besides, consideration must be given to the difficulty of truly centering small drills when laid into a holder that is also used for large drills and of firmly holding them during the grinding of both cutting edges.

The following advantages are claimed for these drill grinders: Only one setting of the drill is required for the complete grinding operation; it is possible to vary the lip clearance; a swinging motion of the gripping head assures a correctly ground surface; an accurate check of the amount of grinding of each cutting edge is obtained.

AUTOMOTIVE INDUSTRIES
AUTOMOBILE
Reg. U. S. Pat. Off.

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## Widening the Sales Field

BROAD vision has been displayed by the Motor and Accessory Manufacturers' Association in selecting the central theme for its fall convention. "Widening the market for automotive products" is important to all branches of the industry and they class it as one of their major problems. Every new outlet discovered brings increased business for all. The jobber is assuming an increasingly important place in the distributive system and the association has done well to give a place on its program to a consideration of his peculiar needs.

Recognition has been given to the fact that the automotive market cannot be broadened sufficiently by studying questions relating exclusively to the trade. The industry has gone beyond that stage. There is a genuine need for arousing interest in the need for more and better roads; reduced maintenance costs and increased efficiency; more space for parking and driving in congested districts; and removal of unfair motor vehicle taxation.

All of these things have an effect on motor vehicle sales and the need for some solution of the problems involved is increasing constantly. Manufacturers are beginning to take more than an academic interest in these questions and greater activity along this line seems likely during the next few years.

## Have 3,000,000 Cars Faulty Brakes?

"THREE million motor vehicles in this country need brake adjustment," according to publicity put out by the newly organized Asbestos Brake Lining Association. This declaration is said to be based on estimates and statements received from municipal authorities who have tested brakes and found that an average of at least one out of every four vehicles has defective control apparatus.

If this statement is true, and we are inclined to doubt whether it will be questioned by persons in a position to know, it reflects no credit either upon the designers and manufacturers of brakes or the makers of brake linings. It does show, however, that there is ample room for improvement in brake design, brake manufacture and brake materials. It may well be true that the user is at fault in a large majority of cases for failure to see that brakes are kept in adjustment or are relined when this is required, but it is not amiss to inquire to what extent those who make the product which needs adjustment or repair are responsible for its condition.

Few indeed will deny that safe operation is, or should be, a prime consideration in vehicle manufacture, and that adequate brakes are a most important factor in this connection. Yet we venture to say that it would be hard to find a conscientious and well informed engineer who would not admit that he knows of many cars and trucks which have inadequate brake equipment. There has been too great a tendency to assume that brakes which will lock the wheels when the car or truck leaves the factory are adequate, whereas they are often of too small dimensions, rather crudely made, too short-lived and too difficult to adjust.

Offers of thinner and cheaper brake linings have been accepted in some cases without considering the consequences. While the importance of low first cost is and must be fully appreciated by American automobile builders, it should also be realized that the brakes are a poor place at which to skimp. It would be a great boon to the user, and consequently to the industry, if every car and truck manufacturer would not only resolve to improve brake design and construction, but would in so doing make certain that the brakes are made more durable as well as easier to adjust.

One reason for failing to keep brakes in adjustment is the fact that they are often difficult to adjust and require such adjustment much too frequently. Brakes should require relining not oftener than once a season in the average passenger car. Such adjustments as are required between relinings should take but a few moments' time, involve no need for getting under the car and a minimum of mechanical skill.

Both sets of brakes should be capable of easily locking the wheels, and even after considerable use should be made of such proportions and materials as not to be rendered useless by a few lengthy applications on heavy grades. Until American car builders have fulfilled these requirements they will continue to be open to criticism both on the ground of building cars which are not as safe to use as they should be and of failing to meet a demand for better brakes.

This is not to be construed as a plea for four-wheel brakes, though this system has certain well recognized advantages, but rather for a general improvement in brakes, however brought about.

## Higher and Lower Heat Values

IN connection with thermal efficiency calculations it is always a question whether to use the higher or the lower heat value of the fuel used in the engine. Most automotive engineers have been inclined to use the lower heat value, for the reason that there is no possibility of converting any of the heat of condensation of the steam in the exhaust products into mechanical work. Use of the high heat value, however, also has its partisans, and their side of the case has been strengthened by the proposal of the American Society of Mechanical Engineers to make it the basis of thermal efficiency calculations, in a Code for Internal Combustion Engine Tests which the Society has in preparation.

The fuels used in internal combustion engines consist chiefly of compounds of hydrogen and carbon, and during the combustion the hydrogen unites with oxygen of the air and forms steam. The steam contained in the exhaust gases contains an amount of energy which partly depends upon its temperature and partly upon the latent heat which is absorbed when water is vaporized and given out again when it condenses. The lower heat value of a fuel is the number of British Thermal Units given out by a pound of the fuel when burned and cooled down to 212 deg. without the steam being condensed. The higher heat value, on the other hand, is the number of British Thermal Units given out by the same amount of fuel if burned and cooled down to a normal atmospheric temperature of 60 deg. Fahr., which, of course, involves condensation of the steam in the products of combustion. For gasoline the lower heat value is about 10 per cent less than the higher.

The argument in favor of using the lower heat value in efficiency calculations is as given above, that there is no possibility of converting the latent heat of the steam into mechanical work in an explosion engine in which the exhaust gases escape at a temperature of more than 1000 deg. Fahr. when the engine is running under full load and at considerably over 212 deg. even when the engine is idling. To this the champions of the high heat value reply that it does not make any difference whether it is possible to convert the heat to mechanical work or not as long as it is there. This argument, it must be admitted, also sounds quite plausible.

Weighing the arguments of the two sides, it does not seem to make much difference whether the high or the low heat value is used, so long as a definite agreement is reached to use one or the other. Otherwise the term "thermal efficiency" will be meaningless.

## Garage Equipment Education

SALE of garage tools and equipment has increased materially because of the need for better and more rapid service. The interest of car manufacturers in dealer maintenance problems has been an important factor in improving conditions. Both the vehicle and garage tool builders have done an excellent educational job as regards the mechanical phases of getting this new machinery into operation. Large sums of money have been profitably spent showing the dealer how to economize in time and labor by installing machine tools and how to use such equipment after he has purchased it.

But the business side of the question has been neglected. The dealer who once required 30 min. for a service job finds himself able to perform it in 2 min. after having installed a machine tool. Then he doesn't know how to adjust his charges properly. He is likely to charge on a time basis, just as he always has done in the past. If the 30-min. job cost $4, he will charge one-fifteenth of $4 for the 2-min. job performed on a machine tool. He fails to recognize the fact that overhead costs and investment in equipment must be charged for as well as actual time. Often he loses a good deal of money before he learns what the trouble is.

Widespread educational work is needed in the commercial application of garage equipment as well as regards mechanical problems. The garage tool builder probably will have to provide most of this business education, but the car manufacturer can help materially by discussing such problems when talking service to his dealers.

## Cold Comfort for "Crepe Hangers"

APOSTLES of gloom who have been wailing for weeks that business is going to the dogs, must be finding cold comfort in reports of railroad car loadings. A new record for all time was established the week ending July 28 when the total of loadings reached 1,041,044. The previous high mark was 1,018,539 the week of Oct. 15, 1920.

It is admitted that business was leaping forward at this time a year ago and yet the loadings of merchandise and miscellaneous freight for this record week were 585,783 cars, or 30,110 more than for the corresponding week of 1922. This doesn't indicate that commerce is in a particularly precarious condition. It probably would have been, however, if warning signals hadn't been heeded some three months ago. The United States can easily be more prosperous than any other country on earth without going crazy.

Best of all, there are no indications that the present volume of business will shrink seriously in the near future.

# Good Business Seen for Month and Half

## August Output Is Likely to Exceed in Volume That Reported for July

NEW YORK, Aug. 13—Half way through August finds the automobile industry in a position where it has secured a fairly good line on the amount of business to be expected up to the end of September. The industry is well satisfied with itself.

It has produced 3,525,000 motor vehicles for the year ending July 31, and in the first seven months of this year has made 2,344,000, an increase of 68 per cent over the corresponding period last year; and while last month's production, 318,000, was 16 per cent below June's, yet it was 29 per cent larger than July, 1922.

Consequently, its reading of the public's palm as to August and September prospects has been made with confidence in its ability to meet any manufacturing demand that may be made upon it.

### Retail Sales Will Be Good

Careful surveys have been made, questionnaires have been sent out and the information received has been carefully weighed, the verdict being that for the remainder of August and throughout September retail sales will be "good." At the same time it has been discovered that the "seasonal slump" has not been as severe as expected; in fact, many have been agreeably surprised over retail sales in the supposedly slow months. Maybe the introduction of new models by some of the leading manufacturers may have had something to do with this situation—it undoubtedly has—but on the other hand dealers report that they are well satisfied with the outlook for the next two months and gratified with the way July held up. Averaging the whole country, they say July was almost as good as June. In a few places, like Atlanta, Detroit, Boston, Dallas, New York and Minneapolis, July sales are reported better than June's.

A survey of the immediate future made by one prominent authority shows that in only a few centers, like San Francisco, Boston, Detroit and Kansas City, can a slowing up be expected, and even in these cities these statements have been qualified by an optimistic note. Such cities as Los Angeles, Denver, Atlanta, Chicago, Indianapolis, New York, Minneapolis, Buffalo and Pittsburgh unhesitatingly declare the immediate outlook is "good," while Dallas and Des Moines say "very good."

Some States find that the farmers are actively in the market, but in general the industrial sections are buying more freely than the agricultural districts. This statement is borne out by the report of one big Detroit concern, which finds that nearly 14 per cent of its July sales were to foremen, machinists, miners, mill workers and laborers.

The factories are in excellent shape to meet the anticipated good business of the next six weeks. Reports from the manufacturing centers lead to the belief that August will show a bigger production than July.

# *Business in Brief*

**NEW YORK, Aug. 13—The Nation's week of mourning undoubtedly had its effect on commercial activities and both business and industry slowed to a marked degree. Added to this such midsummer influences as heat, humidity and vacations were felt and quieter conditions than usual at this time of the year prevailed in various branches of enterprise.**

**Drought and heat have hurt the cotton crop in the Southwest and also corn further to the northward. In the West and Midwest, though, rains have benefited corn. In the Midwest, rains have delayed the harvesting operations somewhat. The Government crop reports lead one to expect larger totals for corn, cotton, barley, oats and tobacco.**

**Textiles show a firmer tendency and there has been considerable activity, although manufacturers are moving cautiously in the matter of commitments until conditions are more settled in the raw material market and a clearer cotton crop report is available.**

**The elimination of the twelve-hour day in the steel industry is something that is giving food for thought, consumers marking time until it can determine what effect this shorter-day schedule will have on production. It is felt that if the mills cannot secure additional labor, operations may have to be curtailed until the shortage can be relieved.**

**Car loadings for the week ending July 28—1,041,044—set a new high record total, being an increase of 12,117 over the preceding week.**

# Ford Will Advertise and Spend Millions

## Parent Company Departs from Custom in Instituting National Campaign

DETROIT, Aug. 15—The Ford Motor Co. has decided to cooperate with its dealers in advertising its various automotive products, plans having been made by the company to spend dollar for dollar with the retailers of Ford cars, trucks and tractors. This means the expenditure of several millions of dollars annually by the parent company for national advertising, which will include newspapers, magazines and billboards.

Not for years has the Ford Motor Co. had an advertising appropriation. It has been left to the dealers to inform the public of the merits of Ford products, and these dealers have been spending something like $3,000,000 a year for this sort of publicity. Now the Ford Motor Co. has committed itself definitely to help, and with this end in view an advertising contract has been let calling for expenditures that may run as high as $7,000,000 annually.

Supervision of the advertising will be under the direction of Norton T. Brotherton, who is familiar with the Ford policies through having handled considerable of the cooperative advertising put out by Ford dealers. Brotherton is well known in automotive circles, having specialized on automobile accounts.

This latest move, hooked up with the announcement that there will be some changes in Ford cars within a short time, is interpreted to mean that the Ford Motor Co. has adopted a vigorous sales policy in anticipation of the time when the huge new plants at St. Paul and other points get into a production that will exceed even the record-breaking pace of today.

# Mason Truck Will Be Made at Flint, Not Bridgeport

BRIDGEPORT, CONN., Aug. 16—E. B. Jackson, vice-president and general manager of the Locomobile Co. of America, announces that a change in policy has been made whereby the Mason Road King, Durant's motor truck, will be manufactured at Flint, Mich., instead of in the local plant.

This is taken to mean that the Locomobile unit will confine itself to the Locomobile and Princeton. Production on the latter will start Jan. 1, with an initial output of 1500.

### GENERAL BATTERY TO EXPAND

EAST MOLINE, ILL., Aug. 11—A three-year expansion program with an increase of 100 per cent in production was announced by G. H. Jones, president of the General Battery & Supply Co., at a dinner to stockholders this week.

# Gasoline Price Cuts Become Widespread

## Governors Out to Aid Motorists —Government Will Make Investigation

NEW YORK, Aug. 15—Following the action of Governor McMasters of South Dakota in ordering his State Highway Department to retail gasoline at sixteen cents a gallon because of the high rates charged at regular filling stations, there has been plenty of action and the end is not yet in sight.

Other governors have taken up the cudgel in behalf of the motorists; both the American Automobile Association and the National Motorists' Association have taken definite steps to force the issue as to prices, while the gasoline war has been officially recognized by the United States Department of Justice, which announces it will investigate prices to determine if there has been an illegal combination to restrain trade or fix prices.

### To Investigate Closing Action

Attorney-General Daugherty states that the Government's initial inquiry will be directed at the action of twenty-five midcontinent refineries which simultaneously announced their intention to close during the whole month of August.

Quick action on the part of the Standard Oil Co. of Indiana shows that McMasters scored a bullseye. Simultaneously with South Dakota going into the selling market with 16-cent fuel, the Standard Oil Co. of Indiana reduced its prices 6.6 cents in Illinois, Iowa, Indiana, Michigan, Wisconsin, Minnesota, North Dakota, Kansas, Missouri and part of Oklahoma. The independents have met this by cutting 5 cents, which is claimed to be below the cost of production.

In Chicago yesterday motorists were buying their gasoline at the new prices and rejoicing because of the war, but the cut has not yet reached New York, although it is hinted there may be a reduction of 1 cent this week. Kentucky, Florida, Mississippi, Alabama and Georgia already have been given the cent by the Standard Oil Co. of Kentucky, while at Fort Worth, Tex., one independent has taken off 2 cents, bringing the price to 11 cents.

### Motorists Are Satisfied

It is expected that it will be several days before the whole country will be included in the reductions. How long they will last is another question, but still motorists feel they are bound to profit by the agitation and that the outcome will be generally lower prices.

As of today, the average tank wagon price through the country, based on reports from thirty cities, is 16.55 cents, as compared with the previous best low of the year of 20.2, and comparable with 29.3 as of Jan. 1, 1921. In this present average the high is 24.5 at Butte, Mont., and the low 10 at Dallas, Tex.

Undoubtedly the action on the part of the consumers taking matters into their own hands as interpreted through Governor McMasters' bold action has been most disconcerting to the oil industry in general. It is asserted that the high cost of distribution can be blamed for the high prices charged at filling stations.

While it is admitted that gasoline can be purchased in California for 7 cents and at 8 cents in the midcontinent, the oil people claim that it costs 3 cents a gallon to bring gasoline from California steamers, and that the cost of transporting midcontinent gasoline to the eastern seaboard by tank car is 5 cents a gallon.

Gasoline, they say, can thus be laid down here for from 10 to 13 cents, and it is pointed out that Standard Oil is getting 20½ cents from the garagemen, who in turn sell it for from 23 to 25 cents.

(*Continued on page* 352)

# *E. S. Evans Expects No Difficulty in Obtaining Adequate Shipping Facilities Despite Crop Movement*

By D. M. McDonald
*Detroit News Representative of the Class Journal Co.*

Detroit, Aug. 15.

**STEADY expansion of shipments of automobiles not only in the remaining months of this year but in 1924 are being planned by leading companies, an expansion which is going to add several to the thousand-a-day class and add another thousand to at least one company which has been in the thousand daily class for some time.**

**That manufacturers are confident of the continuance of prosperity in the presidential year is evidenced by this. Many things may intervene to change the aspect of conditions by then but estimates on loading material which have been submitted to E. S. Evans & Co., indicate that the leading companies at least are preparing for an output in the coming year which will exceed considerably the outputs of this year.**

**In his own particular part of the automobile industry, Evans said there is no sign of slackening other than the slowing down incidental to the season and to the interruption of factory schedules caused by changes in cars. His company, he said, is lining up a timber supply which will carry it well into the future on a basis of car shipments, running well in advance of the present year.**

**No particular difficulties in obtaining adequate shipping facilities due to grain movement is expected by Evans to confront the industry this year, though he said it will probably have to resort to freight cars other than box cars for the time being. Lake shipments are being used more extensively than ever, he said, and as long as the navigation season continues open there will be no difficulty in moving all the cars that can be built.**

**The industry is being well taken care of in the rolling stock that is being added by the railroads, he said, and ample facilities are assured for its expanding needs. In the difficulties that were experienced during the past winter it was not so much a shortage of freight cars as of motive power which made shipping difficult. Freight cars were being moved so slowly that six days were required to cover distances which should have been reached in one. This meant taking cars out of service four or five days in every week.**

**Speaking of the possibilities of further development in the loading equipment now being used, Evans was of the opinion that equipment now being used would continue indefinitely while freight cars of the present types were employed, and while it continued to be possible to buy timber at reasonably low figures. The industry is now saving millions of dollars yearly through lower freights and labor costs and absence of breakage by application of scientific methods in its loading.**

**Increase in popularity of American cars in foreign countries is due in no small measure to the fact that American manufacturers have learned to crate their export shipments so that they arrive undamaged at their destinations. Companies which have been most successful in an export way attribute a considerable measure of their success to proper crating, Evans said.**

# Interest Roused in Plan to Rehabilitate Pan Motor

DAVENPORT, IOWA, Aug. 11—More than 10,000 Iowans who lost in speculation in the Pan-Motor Co. are interested in the new proposal to rehabilitate the plant and participate in the purchase at receiver's sale of the physical property this month for $2,500,000.

W. W. Hubbard, Des Moines, a construction and production engineer, will go to St. Cloud, Minn., where the plant is located, to be secretary and treasurer of the reorganized concern.

The company produced 2500 cars, which are scattered about the country, and these make a steady demand for replacements. Capitalization of the new company has not been definitely fixed nor has the new name been decided upon.

In the meantime the stockholders' interests in this venture rest with three trustees appointed to act for them: Judge R. H. Hutchinson, Spokane, Wash., chairman; H. E. Keeler, Denver, and W. W. Hubbard, Des Moines.

# In 6 Months Peerless Netted Nearly Million

## Stockholders Will Be Shown Strong Position Attained Under Collins Regime

CLEVELAND, Aug. 15—Manifestations in the Peerless Motor Car Co. situation that have come since David Rockwell, Jr., a minority stockholder, filed two suits, in each of which he asked for the annulment of a contract made by the Peerless directors with R. H. Collins, president, indicate that Collins will ride safely through the trouble that was started when the suits were filed.

Since the courts were asked to interfere in the affairs of the Peerless company the stock has climbed over seven points, which represents an appreciation in the value of the outstanding shares of $1,900,000.

**Profit Exceeds $4 Share**

The stockholders of the company will meet in this city on Aug. 17 to hear the report of their directors, and they will be told then that the official audit for the first six months of 1923 shows a net profit after taxes of $955,995, or slightly more than $4 per share. The statement is as of June 30, 1923. This compares with $1,005,112, or $4.35 per share, for the entire year of 1922. The report shows that the entire dividend for the year 1923 was more than earned in the first six months.

One of the important changes that appears in the statement is the reduction from $2,862,034 to $1 in the account in patents and good-will and a reappraisal of the land and building account from $2,641,560 to $5,699,336. The stock, according to the audit, has a book value of $49 a share. On Dec. 31, 1922, the company had borrowed $1,387,188, while on June 30, 1923, this was cut to $668,936. F. A. Trester, the secretary, states that since June 30 this amount has been entirely wiped out, so that the company has no bank indebtedness.

**Collins Will Cancel Contract**

Collins some time ago tendered his resignation to a committee of directors to be submitted to the board in the event the stockholders did not approve his contract with the company. In the event the contract is ratified, he has stated that he will cancel it and then enter into a new compensatory agreement with the company.

When the stockholders get together here, Collins will have back of him some of the strongest and most influential business men of this city, who are directors of Peerless. They are prepared to argue that, in the face of the strong showing of Peerless during the Collins régime, the contracts with Collins have been justified. In one of these Peerless purchased plans for the present model, and in another contracted to pay Collins a bonus of $65 on every car manufactured after $1,000,000 was earned.

Since the suits were filed, it has developed that the present management had planned to play another trump card in the launching of a six-cylinder car, plans for which had been developed by Collins before he came here from Detroit, and the making of which had been held in abeyance until Peerless' position was strengthened.

## *PARTS MAKERS ORDER THEIR WINTER COAL*

**NEW YORK, Aug. 13—Checking up the condition of the coal bins of the parts industry, General Manager M. L. Heminway of the Motor and Accessory Manufacturers Association finds that on the whole his constituents do not have to worry much when winter comes.**

**Gathering the information for J. Walter Drake, assistant secretary of the Department of Commerce at Washington, Heminway, basing his report on answers from 121 members of the M. A. M. A., finds that on Aug. 1 thirty firms had ordered under 25 per cent of their winter's supply; thirty-six, from 25 to 50 per cent; seven, from 50 to 75 per cent, and thirty one, over 75 per cent.**

**On Sept. 1 sixteen will have under 25 per cent of their coal delivered; thirty-two, from 25 to 50 per cent; nineteen, from 50 to 75, and thirty-one over 75 per cent. Nine of the others use other fuel than coal; four had all their storage space filled; two were located at the mines and so do not have to worry; while two others have no storage capacity.**

# George C. Morgan Named Sales Manager for Elgin

INDIANAPOLIS, Aug. 14—President J. H. McDuffee of Elgin Motors has announced the appointment of George C. Morgan as sales manager for the Elgin organization. Morgan recently was connected with the Pilot Motor Car Co. in the same capacity. For a considerable time he was identified with the Willys-Overland Co. in charge of the Toledo branch, and later acted as sales manager of Earl Motors.

The refitting of the new Elgin plant has been almost completed, and the executive offices of the company have been occupied for some time. Announcement of the details of the new Elgin will be ready for release in a short time, and production is promised to start during September.

As remodeled and prepared for Elgin use the former Federal Motors plant gives promise of real manufacturing efficiency under the new management.

# Willys Sits Firmly in Overland Control

## Five Directors Resign from Board and Are Replaced by His Associates

TOLEDO, Aug. 14—That John N. Willys is sitting firmly in the saddle and in full control of the Willys-Overland Co., following the sale of the big lot of common stock held by the Willys Corp. to the Tracy syndicate, was evidenced today when there was a general upheaval in the board of directors.

Five resignations from the board were handed in, including those of H. L. Thompson, chairman of the board and chairman of the executive committee; F. A. Judson, financial vice-president; W. W. Knight, member of the executive committee; Charles E. Bunting and George L. Heater.

In their places were elected Thomas H. Tracy, the Toledo attorney who led the fight in the courts for the disputed common stock; George M. Jones, president of the Ohio Saving Banks & Trust Co.; G. I. Webb, coal operator and associate of Jones, and C. O. Miniger, president of the Electric Auto-Lite Co. These four, with John N. Willys, will dominate the board. It is understood that there will be no one named as chairman of the board to succeed Thompson.

This reorganization of the board follows the payment of the last installment on the bank debt of $17,000,000.

**Miniger Gets U. S. Light**

BUFFALO, Aug. 10—That control of the U. S. Light & Heat Corp. has passed from John N. Willys and associate interests to C. O. Miniger of Toledo and his associates, was announced today by R. H. Van Nest, vice-president and treasurer of the big concern, in a statement covering the annual meeting, held on Wednesday at the Highland Avenue offices in this city.

"Mr. Miniger and his associates acquired the Willys interests in our company recently," the statement says, "and the control in the directorate was accordingly changed by the stockholders at Wednesday's meeting by electing Mr. Kelly and myself as directors in place of two former New York men, C. O. Moore and Henry J. Falbusch, who represented the Willys interests." D. H. Kelly is the first vice-president and assistant to the general manager.

Aside from these two changes, the new board of directors was elected as follows: E. H. Gold, Chicago; C. O. Miniger, Toledo; F. J. Coe, G. G. Shepard and D. H. Kelly of Niagara Falls; J. O. Moore, Buffalo, and E. J. Quintal, H. A. Rich, W. F. Hackett and J. H. Stafford of New York City. All officers were re-elected.

Other action taken was the changing of the date of the annual meeting from the second Wednesday in August to the third Monday in March.

# Defendants Appeal Coast Tire Ruling

## Court Thereupon Halts Execution of Order Appointing Temporary Receiver

OAKLAND, CAL., Aug. 16—Settlement of the suit of the stockholders of the Coast Tire & Rubber Co. against certain officials and directors of the corporation to compel an accounting, relinquishment of stock and settlement of charges of misuse of stock has been further delayed by a notice filed by the attorney for the defendants that the decision of Judge T. W. Harris, appointing a temporary receiver, would be appealed. Judge Harris immediately granted a stay of execution.

This appeal automatically holds up not only the suit for a receiver, but the pending suit to oust the officials and directors, compel an accounting and so on, instituted by the committee of stockholders.

**Lanktree Appointed Receiver**

Judge Harris, in deciding in favor of the stockholders in their suit for a temporary receiver, appointed J. B. Lanktree, fixed his bond at $50,000, and refused the offer of Gavin McNab and Nat Schmulowitz, attorneys for the defendant officials, to furnish bond for these defendants as guarantee of their future actions, providing a receiver be not appointed.

In conjunction with the appointment of a temporary receiver, Judge Harris granted a restraining order, preventing the defendant officials voting 100,000 shares of stock, valued at $1,000,000. This order prevents the defendants from using the voting power of this stock to elect a new board of directors, thereby invalidating the appointment of a temporary receiver, but does not prevent the stockholders from electing a new board of directors and thus supplanting the present directors and the accused officials.

The defendants in the suits, who are thus prevented from taking action as directors, are Holmes Ives, president; J. C. Pamkratz, vice-president; A. W. Shepherd, secretary-treasurer, and N. J. Whelan, formerly a State senator from Michigan.

The plaintiff stockholders named in the action are L. Skelly, J. A. Nielsen, D. G. Hendley, G. L. Bugg and O. B. Caldwell, forming a committee which, in turn, represents rather more than 400 stockholders.

**Charge Blue Sky Violation**

The defendants named above are under indictment by the San Francisco County grand jury on charges of violating the blue sky laws of the State in connection with the affairs of the Bankers' Mortgage & Discount Co. and two other subsidiary companies alleged to have been formed by the defendants. An operating loss of $533,000 is charged by the plaintiff stockholders as a result of the actions of the defendant officials and directors.

The new appeal of the defendants from the appointment of a temporary receiver is based on the claim that this appointment will embarrass them in their defense of the grand jury indictments and will hold up for some time both the taking over of the $5,000,000 concern by the receiver and the trial of the defendant officials on the indictments returned in San Francisco.

## *FEDERAL BUREAU SAYS AERIAL AGE IS NEAR*

**WASHINGTON, Aug. 14—A study of aeronautics in the United States in comparison with the growth of the automobile made by the United States Bureau of Standards has resulted in the statement that the United States is at the threshold of an aerial age.**

**Within ten years, the bureau forecasts, the airplane will be as firmly established in the everyday life of America as is the automobile now. The coming decade, 1923-1933, will witness an expansion of the use of aircraft comparable only to the amazing advance of the automobile in the years 1905-1915, the bureau predicts.**

**The aerial age will bring not only a new vehicle of transportation and communication, the bureau believes, but it will have important and far-reaching effects on the economic and social fabric of the nation.**

# Stockholder Files Suit Against Sale of Waltham

BOSTON, Aug. 13—Edwin Hale Abbot of Cambridge, a stockholder, has filed a bill of complaint in the Supreme Judicial Court, requesting that the recent sale of the Waltham Watch Co. to the Waltham Watch & Clock Co. be declared void, that receivers be appointed, that the damages sustained in the premises by the company be ascertained and that execution issue therefor.

Abbot alleges that the defendants combined to procure a dissolution of the Waltham Watch Co. and a sale of all its assets to the Waltham Watch & Clock Co. "upon terms unjust to the watch company and its stockholders." He charges that the defendants knew that the improved financial condition of the watch company rendered its sale unnecessary.

**ONLY GERMAN CARS AT SHOW**

WASHINGTON, Aug. 15—None other than German-made automobiles and automotive products will be exhibited at the Berlin automotive exhibit, which was omitted last year, but which will be resumed this year on Sept. 28 to Oct. 7.

# Durant's Flint Plant Ready in September

## Three Hundred Flints Expected to Be Produced at Start of Operations

FLINT, Aug. 13—The Flint six-motor car plant, under construction in South Flint by the W. C. Durant Corp., will be in production by Sept. 15, according to present plans. This plant will contain 1,500,000 sq. ft. of floor space and cost approximately $1,500,000.

According to the Durant corporation, more than 3000 men will be employed. A daily production of 300 automobiles is planned at the start. As the factory plans progress, it is expected to reach a daily production schedule of 600 cars.

The plant will be in charge of William E. Holler as general manager. Warren H. Farr of Flint has been made factory manager; Frank Stern, comptroller; Roy M. Taylor, supervisor of materials; E. G. Rice, traffic manager; Joseph E. Clark, assistant traffic manager; Roy Herrlich, purchasing agent; A. D. Cuthbertson, personal service, and C. H. Turner, office manager.

The Star plant, which adjoins that of the Flint six, and which is now under construction, will not be ready for operation until later in the year. The new buildings at the Durant plant include an addition to the power house in which two new boilers will be installed, making a battery of four. There is also a large one-story building, a loading building for new automobiles and a two-story supply building.

The floor for the storage and loading shed has been laid and the walls soon will be started.

# Pacific Coast Will Get $15,000,000 Furnace

SAN FRANCISCO, Aug. 16—The Pacific Coast Steel Co. has virtually concluded negotiations for land for the erection of a large blast furnace in South San Francisco, according to T. T. C. Gregory, attorney for the company.

The company recently increased its capitalization from $1,000,000 to $5,000,000 and sponsored the Pacific Coast Steel Corp., capitalized at $40,000,000.

Its present objective is a tidewater blast furnace, to which the raw materials can be shipped by rail from Utah, where it owns iron mines, and converted into steel for sale to Pacific Coast manufacturers at a lower price than the Pennsylvania steel mills will sell it on the coast. This is where the coast automobile manufacturer becomes interested, since one of the greatest factors in holding back the establishment of automobile factories and plants to manufacture accessories and equipment on this coast has been the high price of steel. The company has set aside $15,000,000 for the cost of the blast furnace.

# A.A.A. Urges Wider Streets and Roads

## Will Seek Cooperation of Municipal Officers in Solving Traffic Problem

WASHINGTON, Aug. 14—Anticipating the needs of traffic requirements, the American Automobile Association, through its traffic bureau, announces that it will seek the cooperation of the city, county and State road officials in having future streets and roads made wider.

In practically all large cities, and even in smaller places, the present traffic needs tax the street facilities, the association points out. In order to take care of the future the association will seek to have present narrow thoroughfares widened and to have those to be built so constructed as to care for growing motor vehicle requirements, Thomas P. Henry, president of the association has written all affiliated clubs along this line.

In his letter, Henry says:

The question of solving local traffic problems can be answered by a scientific study of the needs of a city and how they may be met. While the cost of an adequate street plan may be staggering, it must be borne in mind that the cost today will be less than it will ever be in the future.

The lesson which the larger cities are learning from experience should prompt smaller cities and towns to begin their city planning to take care of future motor vehicle traffic now and not wait until it becomes imperative and the cost of widening and connecting streets becomes almost prohibitive.

## Truck Assembling Plants to Be Taxed in Georgia

ATLANTA, GA., Aug. 14—Action on several tax bills affecting the automobile industry in Georgia was taken last week by the Georgia State Legislature, now in annual session in Atlanta.

A measure to fix a $5,000 per year tax on automobile assembling plants in the State was defeated.

On automobile truck assembling plants the annual tax will be $300.

## Nothstine Stockholders Ask for an Accounting

DES MOINES, IOWA, Aug. 13—Complaints have been filed with the Polk County attorney by stockholders of Nothstine Valveless Engine Co., who allege they were led to invest in the company through false representations of its financial condition and character.

Stockholders are demanding an accounting of the $15,000 that they claim was received from stock, in efforts to ascertain whether all of this money was used in promoting the company. Among other allegations, stockholders claim that E. W. Nothstine, president and promoter of the company, agreed to employ some of the investors at salaries ranging from $2,500 to $15,000 per year in order to induce them to purchase stock.

The Nothstine company was organized several months ago and incorporated for $50,000 to manufacture a rotary valveless steam engine invented by Elmer Nothstine, son of the president. The sheriff recently placed the offices of the company under lock and key on a landlord's lien for unpaid rent.

## General Motors to Sell Old Milburn Body Plant

TOLEDO, Aug. 14—The old Milburn electric car plant here which was sold to the Buick division of the General Motors Corp. several months ago, to be used for body building purposes, is advertised for sale by General Motors.

The increased closed body capacity of the Fisher Body Co. is said to have made the Milburn plant unnecessary. The Milburn electric vehicle business has been taken over by J. A. Kellam, formerly Toledo distributor for that concern, while the Milburn body business was closed out by the Milburn company before General Motors took over the plant.

## Power Truck Shows Court Good Earnings This Year

ST. LOUIS, Aug. 14—Stockholders of the Power Truck & Tractor Co. at a meeting held recently petitioned Judge Frey, who granted a temporary injunction against the company restraining the further sale of stock, to permit the company to continue operations under the present management and to deny a petition filed by several stockholders for a receivership.

P. G. Craven, president of the company, presented a financial statement showing that the net earnings of the company have been 4 per cent since the first of the year.

## New Book-Cadillac Hotel Will Be Ready Next Year

DETROIT, Aug. 13—The new Book-Cadillac Hotel, now under construction in Detroit, will be the tallest transient and commercial hotel building in the world.

A large part of the transient population of Detroit is made up of automotive business men calling on the local plants.

It is stated that the hotel will be completed by Oct. 1, 1924.

### GEORGE B. SHARPE DROWNED

DETROIT, Aug. 13—George B. Sharpe, advertising manager of the Burroughs Adding Machine Co., was drowned Friday at Algonquin Park, a resort about 200 miles north of Toronto. Mr. Sharpe was well known in the automobile industry, having been advertising manager of the Studebaker Corp. from 1904 to 1907 and advertising manager of the Cleveland Tractor Co. from 1918 to 1921.

# Auburn Revises List of Its 1924 Models

## Prices Reduced with Exception of Sport Phaeton and One Type of Sedan

AUBURN, IND., Aug. 15—A new schedule of prices covering its 1924 models has been announced by the Auburn Automobile Co. Other than having a few minor chassis and body refinements, the new cars will be identical with the 1923 lines.

On practically all models the prices have been lowered from $40 to $135, the exceptions to these being the 6-43 sport phaeton, which on account of still further additions of extra equipment has been increased $50; the 6-63 sedan, which remains unchanged at $2,345, and the announcing of an entirely new sedan model on the 6-43 chassis, listing at $1,595. The "touring coupé" on the 6-43 chassis was formerly known as the brougham.

The following table shows the latest prices, effective immediately:

| 6-43 | Old Price | New Price |
|---|---|---|
| Standard Phaeton | $1,165 | $1,095 |
| Sport Phaeton | 1,275 | 1,325 |
| Touring Coupe | 1,535 | 1,495 |
| Sedan | New | 1,595 |
| **6-63** | | |
| Standard Phaeton | $1,725 | $1,595 |
| Sport Sedan | 1,985 | 1,850 |
| Sedan | 2,345 | 2,345 |

## British Makers Continue Their Price Reductions

LONDON, Aug. 6 (*by mail*)—Although trade has fallen away since Whitsuntide, the tardy advent of summer has brought out a steady demand for automobiles. This demand should last for some weeks. Sales have been furthered, too, by a number of price reductions, the latest being a drop of £55 on the 14-hp. Crossley.

A few firms outside Coventry claim satisfactory business, but they are not independent builders in the full sense, as they draw on important components made at Coventry.

Price falls have also helped motorcycle sales, trade continuing to be healthy. Trucks are still affected by surplus war stocks, both at home and on the Continent, although in an ever lessening degree.

Export trade is still poor, the Far East being the only bright spot both for cars and motorcycles. It is anticipated that competition will be keen among manufacturers next season, and that further price falls will result.

### MAXWELL TRUCK PRICE HIGHER

DETROIT, Aug. 14—The Maxwell Motor Sales Corp. has advanced the price of its 1½ ton speed truck to $1,095 an increase of $165 over the former price of $932. A line of eight various body styles are offered with the chassis.

# General Motors Adds 2-Ton Truck to Line

## Chassis Is Designed for Long Body—Is Suitable for Haulage and Bus Work

PONTIAC, MICH., Aug. 11—A new 2-ton truck with a wheelbase of 191½ in. has been added to the line of the General Motors Truck Co. Production has already started on this model, which will sell for $2,475, list price at the factory.

The model was added to meet the demand for lumbermen, furniture dealers and moving van operators for a truck that would accommodate a long body, but at the same time, would not demand an excessive weight. The chassis is also suitable for bus work.

The factory has made provision to equip the model with vacuum tank, pneumatic tires, special fenders, gas tank and extra large generator.

The new addition brings the total number of truck chassis models to eight, the line now consisting of a 1-ton equipped with four types of express body, 2-ton chassis with a shorter wheelbase, 3½-ton model, 5-ton chassis and the new truck, together with three tractor models.

# R & V Knight Adds Sport and Sedan to Six Line

MOLINE, ILL., Aug. 14—Two recent additions to the R & V Knight Six line are the four-passenger sport car and the seven-passenger sedan. Deliveries are now being made on both of these bodies. They are mounted on the standard chassis. The sport car is unique in that the standard color is black. The popular acceptance of the car in black has been taken by the R & V Motor Co. to be evidence that distinction may be had in design as readily as in gay colors, and that while the buyer is interested in the seating arrangements and appointments of the sport type of car, there is no uncompromising demand for brilliant, conspicuous colors.

The seven-passenger sedan is like the R & V Knight Six club sedan, finished in gray on the lower half and black above.

# Remal-Vincent, New Steam Car, Exhibited on Coast

OAKLAND, CAL., Aug. 15—A new steam car, known as the Remal-Vincent, was recently exhibited to the public here for the first time. The car shown is identical with a well-known gasoline car except for its power plant and controls.

The steam boiler, four-cylinder V-type engine, two-speed transmission and auxiliary engine are located under the hood and floor boards of the front compartment and are unusually compact for a steam power plant. Two extra copper tanks are provided for the water supply, water being pumped to the boiler by the auxiliary motor. A condenser of the radiator type is fitted at the front.

The boiler is of the tubular type, with 280 feet of copper tubing, but built up in sections to facilitate repairs. The engine has slide valves, which are controlled by a slide valve operated by the driver's foot. The auxiliary engine has two cylinders and serves to maintain a constant feed of water and fuel.

It is started by means of an electric motor and a generator is fitted to generate the necessary current. As soon as the engine has picked up its cycle the electric motor is disengaged by the Bendix drive. Ignition of the burner is effected by means of a patented spark plug and no pilot light is used. Once steam is up the fuel and water feed and the steam pressure are controlled automatically.

# New Chinese Electric Car Costs $2 Monthly to Run

WASHINGTON, Aug. 14—The production of a new electric automobile in China has been reported by United States Trade Commissioner Lansing W. Hoyt at Shanghai, which it is claimed will operate on electricity at a running cost of $2 to $3 per month.

The new product is being brought out by Mr. Hu Kuo Kuang, for the last nine years a director of the Shanghai Storage Battery Plant of the Ministry of Communications and a wealthy Chinese manufacturer. Headquarters of the concern are located at 14-15 North Thibet Road, Shanghai.

The machinery of the car is very simple and is trouble proof, requiring little repairs, the Trade Commissioners' report to the automotive division of the U. S. Department of Commerce asserts.

Two-seaters and three-seaters have now been made and these are being sold at from 400 tael to 500 tael (Shanghai tael = $0.72).

# "Silver Swallow" Sport Model Produced by Velie

MOLINE, ILL., Aug. 11—A new sport model called the "Silver Swallow" has been brought out by the Velie Motors Corp.

The silver finish is obtained by highly polishing the aluminum body and hood and covering it with a coat of transparent varnish. In other respects this model is identical with the regular sport model.

### MAKES CAB FOR OLDS TRUCK

LANSING, MICH., Aug. 15—The Lansing Commercial Body Co. is manufacturing a closed cab for Oldsmobile "Economy" trucks. This cab is built to use the standard Oldsmobile windshield and has a ventilating back glass and door windows. The cab can be mounted, painted and trimmed on the truck chassis in Lansing, so that the shipment can be made direct with the truck if desired.

# I.C.C. May Dismiss Rate Plea to Coast

## Examiner Reports Tariff Charges to California from Mid-West Not Unreasonable

WASHINGTON, Aug. 13—In a tentative report issued today Examiner Bronson Jewell of the Interstate Commerce Commission recommended dismissal of the complaint of the Moreland Motor Truck Co. and other manufacturers of automobile trucks and tractors at Burbanks, Oakland and San Francisco, Cal., against rates on gasoline engines and motor truck axles in carload lots from points in Pennsylvania, Ohio, Michigan and Wisconsin to points in California.

The examiner said that the Commission should find that the rates assailed were not and are not unreasonable or otherwise unlawful. It was charged by the complainants that the rates charged on carload shipments of engines and axles between Oct. 14, 1920, and July 26, 1922, were unreasonable and unduly discriminatory. The complainants asked for reparation and the establishment of just and reasonable rates.

Indicative of the rates on engines and axles to Pacific Coast terminals were those of $3.20 from New York, $3.12 from Buffalo, $3.035 from Detroit and $2.955 from Chicago territories effective Aug. 26, 1921. On July 1, 1922, the class rates were reduced to $2.88 from New York, $2.81 from Buffalo, $2.73 from Detroit and $2.66 from Chicago groups. Generally speaking, it is on this basis that the complainants asked reparation.

Where the actual weight was in the neighborhood of 20,000 pounds, they did not ask for a reduction in the Detroit rate of $2.73, but sought a minimum of 20,000 pounds in connection with the $3.035 rate charged, which results in a lower aggregate car revenue.

# I. C. C. Refuses Petition Filed by Southern Cities

MOBILE, ALA., Aug. 15—The joint petitions of the Mobile Chamber of Commerce and the New Orleans Chamber of Commerce requesting the Interstate Commerce Commission to suspend the reduction in rates on automobiles for export from the automobile manufacturing centers of the Atlantic seaboard has been refused by the commission, and the present rates will stand.

A further effort to have the rates reduced will be made on the grounds that Mobile and New Orleans cannot secure as much automotive export business as South Atlantic ports due to present rates.

### CHEVROLET BREAKS RECORD

DETROIT, Aug. 14—The Chevrolet Motor Co. reached the record total of 3839 cars in one day from its American plants on July 31 and on Aug. 3 turned out 2015 from its Michigan plants.

# Fisk's Half Year Net Reached $2,204,208

## Semi-Annual Statement Shows Current Assets Triple Current Liabilities

NEW YORK, Aug. 14—Appropriating $500,000 additional reserve for contingencies, the Fisk Rubber Co. carries to surplus $1,704,208 as a result of the business done in the first half of the year. The semi-annual report shows that gross sales, less returns and allowances, totaled $29,167,849, with net operating profit after depreciation, but before interest, of $3,010,376. After interest and financing charges, this total became $2,204,208.

The balance sheet as of June 30 shows total assets of $53,919,128, included in which are capital assets of $17,752,314 after deduction of $5,246,820 for depreciation. Good-will is carried at $1. Current assets total $30,649,565, against which are carried current liabilities of $10,521,991, reserves of $1,442,916 and surplus of $5,232,702. Details of current assets and liabilities are as follows:

| CURRENT ASSETS | |
|---|---|
| Inventories — Raw materials and finished product at cost or market, whichever is lower | $16,840,777 |
| Accounts and notes receivable, less reserves | 10,430,807 |
| Cash in bank, on hand and in transit | 3,377,980 |
| Total current assets | $30,649,565 |
| **CURRENT LIABILITIES** | |
| Loans payable | $7,885,000 |
| Accounts payable | 2,394,724 |
| Accrued bond interest | 242,266 |
| Total current liabilities | $10,521,990 |

# Reynolds Spring Shows Profitable Six Months

JACKSON, MICH., Aug. 13—The balance sheet as of June 30 of the Reynolds Spring Co. reports a net income after depreciation and Federal taxes of $138,026 for the first six months, as compared with $65,765 for the corresponding period of 1922. Total current assets are given as $1,319,449, compared with $1,380,282 for the period ended March 31, 1923, and current liabilities of $42,557, compared with $13,515.

The board of directors also has declared the regular quarterly dividend on the A and B preferred of 1¾ per cent and a quarterly dividend of 50 cents a share on the common. The board also decided to offer preferred stockholders the right to exchange one share of preferred stock, par $100, for five shares of the no par common up to Sept. 11, 1923.

President Reynolds reported the completion of one of the company's two new buildings and stated that the booking orders in the spring division for the ensuing six months have far surpassed expectations, and it is predicted that the period will be the largest in the history of the company.

## *OMAHA TIRE MAKERS SEEK TRADE THERE*

**OMAHA, NEB., Aug. 14—This city has just closed its "Omaha-Made Tire Week," when the three tire-making plants in this city kept open shop for the public. The week, held for the purpose of inducing motorists of this city to buy tires made here, was ushered in by a proclamation by Mayor James C. Dahlman.**

**The three tire plants are the Overland Tire & Rubber Co., making the Overland; the Nebraska Tire & Rubber Co., producing the Corn-Husker, and the Sprague Tire & Rubber Co., building the Sprague.**

**It is estimated that in 1922 automobile tires and tubes manufactured in Omaha amounted in dollars and cents to $3,093,700.**

# New Company May Build Parker Car in Canada

MONTREAL, Aug. 14—Shareholders of the Parker Motor Car Co. have been notified that a winding-up order for the concern has been issued.

It is said, however, that a new company may be formed and the old stock bought up. The Parker company was organized with a capitalization of $10,000,000, half preferred and half common, but only a few cars were manufactured, largely because of the lack of working capital.

If a new company is formed, it will be capitalized at $1,500,000, of which one-third will be preferred stock. The old stockholders will receive share for share of preferred and 25 per cent of their common stock holding in common stock. Present assets are reported at $32,000, with liabilities the same.

### PLANT FOR LATEX TREATMENT

NEW YORK, Aug. 13—The United States Rubber Co. is establishing a factory in the Federated Malay States for the treatment of latex by the Hopkinson process. It is understood that at this plant, which will be located at the port of Swettenham, 300 tons will be used monthly and that the latex will be shipped in liquid form to the United States.

### YELLOW CAB BRANCH ON COAST

SAN FRANCISCO, Aug. 15—The Yellow Cab Manufacturing Co., Chicago, announces the establishment in San Francisco of a complete service department and supply stock of spare parts for distribution throughout Western territory.

# U. S. Rubber Gained in All Except Tires

## Company's Current Assets, $138,420,000, and Current Liabilities, $58,550,000

NEW YORK, Aug. 14—Although sales for the first half of 1923 totaled $13,776,434 more than in the corresponding period in 1922, the United States Rubber Co., in its semi-annual statement, declares that all of this increase was in sales of commodities other than tires. Chairman C. B. Seger says that the company has more than maintained its position in the tire trade, but results have been unsatisfactory, due to general conditions in the industry.

Total sales for the half amounted to $87,710,205. Excluding tires, which at prevailing selling prices constituted substantially less than one-third of the total sales, the increase in dollar volume of sales was approximately 28 per cent. Seger believes that the business outlook for the last half of the year is encouraging.

### Seger Reviews Statement

Reviewing the semi-annual statement, Seger says:

Net income before interest amounted to $7,743,346; interest on the funded debt amounted to $2,386,803, and all other interest amounted to $783,682, making a total of $3,170,485, thus leaving net profits of $4,572,861 for the first six months, after interest and all other charges, including depreciation of plants. This compares with $3,052,918 for the first six months of 1922, an increase of $1,519,943. The consolidated surplus as of June 30, 1923, after providing for the dividend on the preferred stock payable July 31, 1923, amounted to $33,894,867.

As of June 30, 1923, current assets amounted to $138,420,000, consisting of $54,193,000 in cash and accounts receivable, and $84,227,000 in inventories of finished goods and raw materials, and current liabilities amounted to $58,550,000, consisting of $38,425,000 in bank loans and $20,125,000 in current accounts payable, including acceptances for importation of crude rubber and accrued liabilities. Contractural liabilities representing commitments for purcase of raw materials and supplies covered only current requirements, and as to prices were at or below current market.

Through the operation of sinking funds the company has retired, since Dec. 31, 1922, $772,000 of its first and refunding mortgage 5 per cent gold bonds and $184,000 of its 7½ cent gold notes, thus making a reduction of $956,000 in the funded debt.

### Cash Is $54,000,000

The chief items in the general balance sheet on June 30, 1923, compared with those of Dec. 31, 1922, follow:

| | June 30, 1923 | Dec. 31, 1922 |
|---|---|---|
| Cash and accounts receivable | $54,193,000 | $56,960,000 |
| Inventories | 84,227,000 | 63,666,135 |
| Current assets | 138,420,000 | 120,627,063 |
| Bank loans | 38,425,000 | 25,080,000 |
| Accounts payable | 20,125,000 | 15,444,305 |
| Current liabilities | 58,550,000 | 40,524,305 |

# Men of the Industry and What They Are Doing

### A. H. Swayne Returns Home

A. H. Swayne, vice-president of the General Motors Corp., has returned from a lengthy trip to Europe. Most of his time was spent in England and France, but he made a short trip through Norway and Sweden, studying conditions there.

### Gordon Lee Goes with Fageol

Gordon Lee has resigned as general sales manager of the Yellow Cab Manufacturing Co. to become connected with the Fageol Motors Co. of Oakland, Cal., maker of six and eight-wheel buses. It is understood that Lee will be general manager of a bus manufacturing plant which the Fageol company expects to establish at some point in Ohio. Lee resigned several months ago as chief of the automotive division of the United States Department of Commerce to accept the place with the Yellow Cab Manufacturing Co.

### Champion Appoints De Witt

M. C. De Witt, one of the founders of the Jeffrey-De Witt Co., now a subsidiary of the Champion Spark Plug Co. of Toledo, has been appointed vice-president in charge of merchandising and advertising of the Champion company, succeeding George B. Nason.

### O. P. Kilbourn Promoted

O. P. Kilbourn, long associated with the sales department of the Willys-Overland Co. at Toledo as sales promotion manager, has been appointed assistant sales manager. In 1916 he joined the Willys-Overland New York branch as sales promotion manager, leaving to enlist in the regular army. After active service overseas he was connected with the John N. Willys Export Corp. of New York, first as advertising manager and then as assistant to the vice-president, in charge of sales. The next call was to Toledo.

### Guy W. Vaughan Resigns

Guy W. Vaughan has resigned as operating head of the Marlin-Rockwell group and the presidency of Standard Steel & Bearings, Inc., and their other subsidiaries as of Aug. 1, to interest himself in other undertakings. Vaughan joined the Marlin-Rockwell Corp. a little over two years ago as vice-president and general manager of Standard Steel & Bearings, Inc., and shortly after became vice-president and operating head of the entire Marlin-Rockwell group.

### Kelly Manufacturers' Agent

B. F. Kelly, for several years sales manager for Weidely Motors, and also director of purchases since January of this year, plans to reenter the manufacturers' agency business in Indianapolis and to market automotive and general manufacturing tools, supplies, etc. Previous to his Weidely connection, Kelly served as Indianapolis district representative of the National Acme Co. In the early part of his career he was identified with purchasing and was identified with the Willys-Overland purchase department, becoming chief of the department before he left the company.

### Lewis Identified with Oakes

Philip C. Lewis, at one time in the advertising department of the Nordyke & Marmon Co. and later with the Herold-Garber Co. of Indianapolis, has joined the Oakes Co. in the sales and advertising department and will specialize on the accessory side of the business, which includes Oakes spare tire and wheel locks, tire carriers, transmission locks, etc.

### Highleyman Joins Chevrolet

S. D. Highleyman, assistant sales manager of the light lines of the Emerson-Brantingham Co., Rockford, Ill., has resigned to become identified in an executive capacity with the Chevrolet Motor Co. at its Janesville, Wis., plant. Higleyman has been with Emerson-Brantingham seven years.

### Leitner Succeeds Lauer

L. Leitner has succeeded C. J. Lauer as chief engineer of the Detroit Steam Motor Corp. of Detroit.

### Meyer to Sail for Europe

Christopher J. Meyer, president of the Evinrude Motor Co., Milwaukee, will sail from New York Sept. 5 for Europe to visit the branch Evinrude works at Munich, Germany, and also to tour the Continent and British Isles for business and pleasure.

### Stegeman Resigns

Oscar Stegeman, for six years associated with the American Automobile Co., Milwaukee, distributor of the Pierce-Arrow in Wisconsin and upper Michigan, has resigned, effective Aug. 1. He was general sales manager for the past three years, previously being in charge of truck sales. Stegeman is a veteran member of the S. A. E., and for many years was president and general manager of the Stegeman Motor Truck Co., Milwaukee, now the Parker Motor Truck Co.

### Oliver with Whitman & Barnes

Edward T. Oliver, who has been representing the Victor Tool Co. as general salesman, has become associated with the Whitman & Barnes Manufacturing Co., Akron, manufacturer of twist drills and reamers. He will cover Ohio, with headquarters in Cleveland.

### Dunlevy Joins Climax

Lorimer Dunlevy, formerly works and production manager of the Rochester Motor Corp., Rochester, N. Y., has become assistant works manager of the Climax Engineering Co. of Clinton, Iowa.

### Connell Locates in Melbourne

Dennis Connell, formerly night superintendent for the Fisk Rubber Co. at Chicopee Falls, Mass., has resigned and gone to Melbourne, Australia, to be superintendent of the plant of the Melbourne Tire & Rubber Co.

### Boyce Visitor at Lansing

W. B. Boyce, representative of the General Motors Export Co. for Spain and Portugal, visited Lansing recently. Boyce states that there is an outlook for increased business in Spain during the coming year.

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## Automobile Men on Board of Georgia Finance Firm

DETROIT, Aug. 13—A number of automobile men of this city are interested in the American Finance & Mortgage Co., organized in Savannah, Ga., and capitalized at $1,000,000.

Lewis H. Smith of Savannah is president; Howard E. Coffin, vice-president of the Hudson Motor Car Co., vice-president; H. P. Hodkins of Savannah, secretary-treasurer, and C. S. Anderson of Detroit, assistant secretary-treasurer.

The members of the board of directors are Ford Ballantyne, secretary Michigan Alkali Co., Wyandotte; Howard E. Coffin; Eugene W. Lewis, president Industrial Morris Plan Bank, Detroit; Harry M. Jewett, president Paige-Detroit Motor Car Co., Detroit; Alvan Macauley, president Packard Motor Car Co., Detroit; H. N. Torrey, physician, Detroit; P. W. A. Fitzsimmons, president Michigan Mutual Liability Co., Detroit; Clement O. Emory, New York, and Charles A. Bond, Cleveland.

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## U. S. Tractor Successor Names Walter President

MENASHA, WIS., Aug. 13—In the conversion of the U. S. Tractor & Machinery Co. into the Wisconsin Automotive Corp. Christ. Walter, a prominent business man of that city, has been elected president and will devote his entire time to the management. Previously Walter was vice-president.

G. D. Harris continues as vice-president in charge of operations. Dr. A. B. Jensen, treasurer, and Joseph G. Sailer, secretary, retain these offices. The company is engaging in the manufacture of passenger buses, passenger cars and general power farm equipment in addition to building tractors and gas engines.

# FUEL COSTS LOWERED IN MANY STATES

## Gasoline Price Cuts Become Wide Spread

### Governors Out to Aid Motorists—Government Will Make Investigation

(*Continued from page* 345)

Some critics say, too, that the present rumpus is a fight on the part of Standard Oil to cripple independent competition by selling gasoline below the cost of production, figuring that with its immense resources it can stand the strain longer than the independents.

At any rate, the war already has affected the stock market, and yesterday the Curb showed values down from one to five points on Standard Oil subsidiaries. It is felt that crude oil, also, will suffer because of this crusade, because producers will compel a price reduction in crude in order to bring down their cost of production.

One statistician has estimated that the public is saving 12 cents a gallon over the high of 1920. Applying this to June consumption gives a daily saving of $2,500,000 to consumers. As to the loss it means to the oil industry, it is calculated that it will figure 10 per cent, which means $800,000,000 annually on the eight billions invested in the oil industry.

In Detroit several automobile executives have expressed the belief that if the new prices continue to fall they will have a stimulating effect on car sales and that trucks will benefit through such reductions and come into more general use.

**Reductions in East**

NEW YORK, Aug. 16—Latest developments in the gasoline war include reductions in the New England and other seaboard States, in the South and the Far West, and an agreement by the Governor of South Dakota to raise the price of gasoline sold by the State from 16 to 20 cents.

This agreement was brought about by a conference between the Governor and a committee representing independent oil jobbers. The reduction made by the Standard Oil Co. of New Jersey and the Standard Oil Co. of New York was one cent a gallon.

**North Carolina Takes Steps**

RALEIGH, N. C., Aug. 11—Attorney General Manning of the State of North Carolina has instituted a probe of gasoline prices in this State. His efforts will be to work out a plan in conference with representatives of the oil companies whereby the prices of gasoline in the State may be reduced and stabilized.

To this end he has summoned to a conference with him in Raleigh Sept. 5 representatives of the Standard Oil Co., the Texas Co. and the Indian Refining Co.

Retail prices for gasoline in the State are said to vary greatly, the variation being as much as 9 cents per gallon in places with equal facilities for securing and handling the product. This is one matter the Attorney General will seek to eliminate through his conference. Another objective aimed at is the alleged purpose of Standard Oil to drive smaller operators out of business in North Carolina by allowing dealers handling its products certain discounts provided they handle only Standard oil.

It is understood that the Attorney General has little complaint against the retailer, but that he would like an agreement on a standard price somewhat below the highest now charged in the State and probably a little higher than the lowest charged.

The Attorney General has no present intention of invoking any law to correct the evils complained of. There is none to invoke to remedy the varying price situation. The North Carolina anti-trust law would apply in the alleged "freezing out" case. But it is the hope of the Attorney General that the practice, if it exists, can be eliminated without resort to the courts.

North Carolina is burning 125,000,000 gal. of gasoline yearly at an average retail cost of 25 cents per gallon, or an aggregate of $31,250,000. The people of the State have $162,000,000 invested in passenger automobiles and $12,000,000 in motor trucks.

**A. A. A. Wants Investigation**

DETROIT, Aug. 15—Speaking for the American Automobile Association on the gasoline situation today, President Thomas P. Henry said:

"American Automobile Association officials have thought for some time that there should be a full investigation of the matter by Congress and we intend to do everything in our power to bring such an investigation about. It is a matter solely up to Congress. Regulation and control of the motor fuel industry which exerts such an influence upon the nation's transportation, is just as necessary as any other interstate commerce regulation."

**Iowa Joins in Gasoline War**

DES MOINES, IOWA, Aug. 13—Following the successful attempt of Governor W. H. McMaster of South Dakota to reduce the retail price of gasoline, Governor Nate Kendall of Iowa has asked the South Dakota Governor for detailed information concerning the plan that forced the price of gasoline down in that State.

Iowa has no funds to buy gasoline for retail sale, but it is possible that a law similar to the one the South Dakota Governor acted under is effective here.

## California Expects to Get 10 Cent Fuel

### Price of Gasoline Has Been Dropping from 21 Cents to Low Mark of 15

LOS ANGELES, Aug. 15—Indications are that California motorists are about to profit from a gasoline price "war." An oversupply of both gasoline and crude oil is assigned as the cause for falling prices. It is predicted that gasoline will retail as low as 10 cents a gallon before the warfare ends.

About last May retail prices were reduced from 21 cents to 19 cents per gallon. Ten days ago some of the "independents" reduced to 17 cents, with the price at some stations 15 cents. An attempt was made to hold the "independents" in line, but seemingly it failed. Two days after the Ventura Company announced through half-page advertisements in the newspapers that its price was 19 cents a gallon and "worth the money," this company reduced to 17 cents.

Richfield, Wilshire and other leaders among the "independents" cut their prices to the same figures. The Standard, Associated, Union and Shell, the biggest producers, however, maintained their price at 19 cents until Aug. 1, when it was cut to 17 cents.

**Independents Surprised**

This was somewhat of a bomb in the ranks of the "independents," as previously the "Big Four" had announsced the intention to "stand pat" at 19 cents. To holders of coupon books or "identification cards" and commercial vehicles all companies have been selling for 2 cents less than the standard price. Patrons of this class continue to enjoy this differential, even with the reduced prices.

Following the cut by the "Big Four," some independent stations on Aug. 2 dropped another cent, making their retail price 16 cents per gallon. Price changes have been coming so rapidly that the usual metal sign displayed at all stations has been cast into the discard, as the figures cannot be repainted rapidly enough or the figures have been covered with paper displaying the new price.

It is estimated that approximately 5,500,000 gallons of gasoline are used annually by motorists in California, so when judged by totals each price slash results in motorists and consumers benefiting by immense sums.

**WAYSIDE INN COST $60,000**

SOUTH SUDBURY, MASS., Aug. 14—It cost Henry Ford between $60,000 and $65,000 to become the owner of the famous Wayside Inn.

# South African Trade Cautious in Ordering

## Dealers Not Augmenting Regular Shipments—Tire Business Unsettled

JOHANNESBURG, SOUTH AFRICA, July 16 (*by mail*)—A regular epidemic of road racing seems to have fallen upon South Africa. Motorists are stripping their cars and trying to beat one another's time on cross country runs such as from Durban to Johannesburg. These runs are for the most part backed by the dealers. For instance a Hupp car, driven by H. P. Rose, is out trying to set new records from Durban to Johannesburg and from Capetown to Johannesburg.

### Out to Make Records

The fastest time, 10 hr. 11 min., put up for the 400-odd miles from Durban to Johannesburg was made last year by T. B. Adair at the wheel of a sporting model 30/90 hp. Vauxhall. Rose has managed to do the distance in 11 hr. 31 min. with a stripped stock model Hupp, and Dave Owen and Harry Rosenthal have done it in 11 hr. 37 min. with a stripped model Chevrolet, which is getting very near to the time put up by the car specially built for speed work. Rose is determined to have another try, and hopes to beat Adair's record, as last time he was out only to beat that set by the Chevrolet.

And when they have all finished Adair declares it as his intention to go out after new records, (at the wheel of an Essex this time). A feature of these record runs is the great interest taken in them by the general public, and the tolerance of the ignoring of speed limits by the police is another interesting sidelight. The runs are being boomed by the newspapers throughout the country, and big crowds watch the record breakers as they speed through the towns.

### Farmers Show Interest

The farmers are showing an inclination to buy cars in spite of the fact that locusts have reappeared all over the country, and have done a great deal of harm to crops. It is feared that the country will have a bad time with locusts next season, and the motor industry is bearing this in mind. In fact things, taken all around, are on a much sounder basis, for the trade no longer possesses that tendency to order cars haphazardly.

The condition of the tire trade is still causing the S. A. Motor Traders Association concern. Things are, to say the least of it, chaotic, and the public appears to have little confidence in tire prices. This state of things, it is understood, is but a reflex of the position in America, although Johannesburg may be feeling it more keenly. Tires have been loaded in big parcels on tire dealers, who in turn have been loading them on the public at reduced prices. The position, however, seems to be easing up a little now.

The South African Railways is going ahead with its plan for motor rail car transport in many country districts, and it is thought that these cars will also be used shortly on certain suburban lines. The use of the motor bus continues to spread, and the Johannesburg Municipal Tramway department is busily engaged in building new street cars to combat the "menace."

All kinds of obstacles seem to be put in the bus companies' way, and the fight continues to be interesting to the public and the motor industry. That buses will eventually come into their own seems fairly certain. There are now about seventy motor buses in Johannesburg alone.

Sunny winter weather has encouraged touring, and it is estimated that more motorists are using cars for long distance work than ever before. This tourist spirit is being encouraged by motor dealers and the press. The demand for new cars continues to be the feature of the industry.

## PERSONAL NOTES

### Allyne-Zerk Appoints Lane

F. J. Lane, general sales manager of the Allyne-Zerk Co., manufacturer of Zerk lubricating systems, has been placed in charge of the company's general sales offices in the Basso building, Detroit. With him is J. H. Shoemaker, who will be in charge of sales through distributors.

### Fry is Apollo Magneto Sales Head

H. De Long Fry has been appointed general sales manager of the Apollo Magneto Corp. of Kingston, N. Y., with headquarters at the factory. Fry is a member of the S. A. E. and has been identified with the industry since 1905.

### Ewell Succeeds Pask

R. G. Ewell of the Auburn Automobile Co., Auburn, Ind., has been appointed advertising manager of the Wayne Tank & Pump Co., Fort Wayne, to succeed Charles R. Pask, who resigned recently to become assistant advertising manager of the Studebaker Corp. at South Bend. Ewell for the last two years has been advertising manager of the Auburn company and previous to that was sales and advertising manager of the Allen Motor Car Co., Columbus, Ohio.

### MACK HEADS CONTEST BOARD

WASHINGTON, Aug. 16—President Thomas P. Henry of the American Automobile Association has appointed Joseph Mack chairman of the Contest Board, succeeding William Schimpf of New York, resigned because of ill health. Mack is new in automobile racing, but long has been an ardent sportsman. He is president and founder of the Joseph Mack Printing House, Inc., of Detroit.

# Returns from Taxes Must Go for Roads

## California Law Benefiting Motorist Who Pays Levy Is Effective August 31

SACRAMENTO, CAL., Aug. 10—California motorists will get all the benefit from the monies collected from motor vehicle and motor fuel taxes, under the new California Vehicle Act, which goes into effect at midnight, Aug. 31. This is believed to be the first time that a State has so arranged the distribution of the proceeds of automotive vehicle imposts to the benefit of the owners of the vehicles themselves.

Percy E. Towne, general counsel for the California State Automobile Association, and head of the committee which helped to draft the new law and assisted in its passage, has made the following statement regarding the results of the taxation features of the measure, which is known locally as the Breed Bill:

### All Precautions Taken

Every possible precaution was taken to make certain that the funds collected from the motorists would be used 100 per cent for the improvement of the roads and highways, and State motor vehicle department service, and for no other purposes.

Funds raised by the $3 flat registration fee will be divided equally between the State and the various counties, after deductions are made to defray the cost of operating the State division of motor vehicles.

The State's share must be spent exclusively for the maintenance, repair, widening, resurfacing and reconstruction of existing State roads. The counties must spend their share for construction and maintenance of county roads, bridges and culverts.

Funds raised by the gasoline tax—2 cents per gallon—must be spent by the State and the counties for identical purposes. This tax is collected from the distributor, which does not mean the garage man or the service station operator, but the original distributor, in four quarterly installments. This should reduce the expense of collection to a minimum. Exported gasoline, sold for use outside the State; fuel purchased for purposes other than to propel vehicles on the highways, and for the transportation of rural free delivery mail, is exempt from the tax.

### Registration Considered

A system is provided whereby the distributor of exempted gasoline, who must pay the tax originally, has it rebated to him when he files an invoice, accompanied by an affidavit. After the rebates are deducted, the funds derived from this tax are divided equally between the State and the counties, the share of each county being computed on the basis of its motor vehicle registrations for the current period.

All fines and forfeitures resulting from arrests by officers employed by incorporated cities must be placed in the street improvement fund, and used exclusively for street improvements. Where such fines and forfeitures result from arrests by State or county officers, such amounts must be paid into the county treasury and used exclusively for the construction and improvement of roads, streets, culverts and bridges.

# Goodyear Sees Price Future As Uncertain

## "Unreasonable to Expect Decline in Raw Materials," Executive States

AKRON, Aug. 11—Interesting statements on several current situations affecting the tire business have been made by officials of the Goodyear Tire & Rubber Co. and printed in the August issue of the "Goodyear News," the company's magazine for dealers.

The price situation is discussed by L. C. Rockhill, general sales manager, who recites the facts leading up to the price increases early in the year and the recent price reductions, and sums up the situation by saying "No one can tell what tire prices will be in the future. No one can tell what the market prices on materials will be. With the active buying season at hand, with the world's rubber supply greatly reduced and the present high rate of consumption, it would seem unreasonable to expect any further decline in raw materials."

### Discusses Price Announcements

W. C. Behoteguy, tire sales manager, discusses a recent statement by another company objecting to the policy of some manufacturers of advertising price reductions.

After stating that it is the policy of the Goodyear company to make newspaper announcements of price reductions when it is to the advantage of the company and its dealers to do so, and to refrain from making them when the opposite condition exists, and that more frequently the company has refrained from such announcements, Behoteguy asks if it is fair to the public for manufacturers to advertise price advances, which he says the average dealer is anxious for the manufacturer to do and not to give the public "the more welcome news of a price decline."

He also comments on the apparent attitude of the Federal Trade Commission that manufacturers should grant price protection to dealers only where a price decline is immediately passed on to the consumer. He wonders if dealers would be willing to surrender their present protection privileges for the sake of having manufacturers refrain from advertising price reductions.

### Branch Costs Taken Up

The cost of operating branches, which has been the subject of much discussion in the tire industry, is treated by W. S. Shilts, comptroller of the company, who indicates that branches are more efficient than independent jobbers in handling the distribution of tires to large numbers of dealers in wide-spread territory. He states the total operating expenses of the Chicago branch of the company as being 3.57 per cent of sales, and says that if there is a jobber who could operate on this margin, with the necessary profit for himself, "we are willing to discuss the matter with him." He also cites the operating costs of the Duluth branch as being only 2.35 per cent.

An article by P. W. Litchfield, vice-president and factory manager, tells the story of the crude rubber situation and indicates that, while American tire manufacturers are a unit in favoring the raising of rubber in the Philippines and anywhere else where it can be raised economically, "no sane man can expect that new plantations will give us 9-cent rubber, or 19-cent rubber, or can possibly within a decade have any effect whatsoever on the cost of rubber tires."

The present price of crude rubber, Litchfield says, is 27 cents a pound, and the cost of production is 30 cents. With this condition prevailing, the British government, whose possessions contain most of the world's rubber plantations, is restricting exports with the object of bringing prices up to the point where the plantations can be profitably operated.

Litchfield adds that the present United States Government investigation of the possibility of developing rubber production in American possessions has the support of his company, and he hopes that some way may be worked out by which American capital may develop rubber plantations under the American flag and may compete with those existing elsewhere.

## *COLORED LABOR GAIN SLIGHT IN DETROIT*

**DETROIT, Aug. 13—Referring to recent Government reports indicating the flow of colored labor North, employment managers in automotive factories here state that they have not found any great increase in the number of such applicants for work. Inquiry at the offices of the employment managers of the Ford, Packard and Dodge Brothers' plants discloses that colored applicants represent about 5 per cent of the total number.**

**This labor is employed very largely in the foundries and similar departments and in a larger degree in some of the machine shop departments.**

# Ford Purchase Plan Helps Sales in Mobile District

MOBILE, ALA., Aug. 15—The new Ford payment plan has materially increased sales for Ford dealers in this district, according to the fifty dealers attending the annual district meeting at Mobile this month.

Ford sales in the district as a whole are considerably greater than they were at this time last year.

# Alunite to Be Used As Aluminum Source

## Detroit Aero Metals Co. Breaks Ground in Detroit for Reducing Plant

DETROIT, Aug. 14—Ground has been broken here for the new plant of the Detroit Aero Metals Co. to reduce large quantities of pure alunite into its component properties — aluminum, potash and other valuable products—a new departure in chemico-metallurgy.

The ore—a volcanic mineral—comes from the Maryvale district of Utah, where it was discovered in immense quantities on the property of the Florence Mining & Milling Co. John A. Fitzpatrick, general manager of that company, is responsible for its commercial mining and development.

Alunite had long been known to chemists as containing about 12 per cent potash, 37 per cent aluminum and 38 per cent sulphuric acid. It was stoutly maintained in many quarters, however, that aluminum could not be taken out of the mineral and that bauxite, from which all commercial aluminum is now made, was the only available source.

### New Alloy Introduced

It has remained for Dr. Glenn L. Williams, the chemist and head of the Detroit company, to prove the contrary and to introduce a new light alloy, glucium, to aluminum workers to take the place of the copper-zinc and other heavy alloys.

Prior to beginning construction on the new factory the Detroit company has been turning out in a smaller plant hundreds of bright, light bars of alunite aluminum with which automobile and other manufacturers have been experimenting.

In the reduction process the alunite ore is ground and roasted. From the roasting oven the sulphuric gases are conveyed into a chamber containing ordinary coal cinders. The gases, uniting with the cinders, liquefy the latter, producing a compound containing many valuable fertilizing elements as magnesium, calcium, iron, aluminum, vanadium and dorium.

### Method of Dissociation

The roasted ore, when cooked in water, becomes potassium aluminate. The dissociation of these elements is accomplished by means of urea, obtained by passing the smoke from the stack through hot coils under pressure.

The urea crystallizes the potassium aluminate into aluminon, which, when electrolized in a furnace, is converted into metallic aluminum 99.8 per cent pure. The dissociated potash in solution is then evaporated and a chemically pure potash in crystals is recovered.

The development work has brought out the claim that the cost of making alunite aluminum will be very low.

# Peru Favors Motor Vehicles in Tariff

## Officials Keep Duty Low to Aid Transportation Development

LIMA, PERU, July 16 (*by Mail*)—The new tariff was put in force July 1. It is a high protective tariff, that is, it is designed to favor the manufacturer of goods in Peru. As automobiles, trucks, and other automotive material are not manufactured in this country, the duties in this class of imports was wisely put low, for the Peruvian legislators realized that the development of a transportation system was the fundamental need of Peru, or any other country that lacked routes of communication.

**Tractors Admitted Free**

The duties on automobiles have been reduced from 60 a kilo gross weight to 15 per cent ad valorem for automobiles up to Lp 500 value (Lp—Peruvian pound par $4.84, present value more or less $4.15); 25 per cent on automobiles valued from Lp 501 to Lp 1500; and 35 per cent on automobiles valued Lp 1501 and up. The duty on trucks and omnibuses that formerly paid 20 cents a kilo gross weight, now pay 0.01 a kilo gross weight. Automotive repair parts have been reduced from 0.60 per kilo to 15 per cent ad valorem. Tractors come in FREE. Automobile tires have been reduced from $1.60 per kilo to $1.00 legal weight; automobile tubes from $1.60 to $1.50 per kilo legal weight; pneumatic truck tires and pneumatic tubes pay 50 cents a kilo legal weight and solid truck tires 0.05 per kilo legal weight. In the case of automobiles, trucks and tubes there are heavy surcharges.

These favorable duties ought to prove a great stimulus to the more extended use of the automobile, and especially the truck in Peru, and are a shining example of enlightened modern statesmanship.

**Ford Prices Drop**

The immediate effect of the duties has been a reduction in prices of Ford automobiles from Lp 280 to Lp 210; of Ford trucks from Lp 225 to Lp 180, and of Fordson from Lp 250 to Lp 195, Buick has advertised new models at reduced prices without giving figures. One tire company has made reductions ranging from 10 per cent to 20 per cent and other tire importers, while not coming out into the open have clandestinely reduced prices.

So far during 1923 exchange has averaged above $4.00 to the Peruvian pound. At present exchange is dropping a little, but it is not expected to go much below $4.00 or to remain there long. A new crop of cotton is coming on the market that should show its influence soon in a rise in exchange. Besides the price of the other products of Peru, copper, wool and especially sugar are extremely good, to say nothing of petroleum and by-products, of which Peru is producing more every day.

Bank clearings during June of 1923 were considerably below June, 1922. However, June of this year was ahead of both April and May, and July is showing big gains.

Taking the first four months of 1923 as a basis, if exports and imports continue at the same rate for the whole year, the total exports and imports of Peru for 1923 will fall a little short of those for 1922. It is, however, unsafe to judge from the first four months, especially when a new tariff has and will play a great part. There are no sure indications, however, of a recession of business.

Interest in road construction is slowly gaining momentum. A half dozen daily papers or magazines are giving the question more or less serious attention and as thought must always precede action, in the building of highways, as in everything else, the increasing publicity that is being given to the question of roads may, in the due course of time, produce corresponding results.

**Sales Good So Far This Year**

LIMA, PERU, July 14 (*by Mail*)—What may be termed the first half of the automobile year in Peru ends with the celebration of the national holidays commemorating the date when Peru achieved her independence. As this time approaches sales of automobiles always increase.

A good number of cars were sold this year, although not as many as there probably would have been if the new tariff had been put in force earlier and the merchants had been given time to import new models. Sales of automotive equipment were probably larger than at any time during recent years because more cars are running. It is a proof of better times that many automobiles which have been laid up have been put in service again.

The sales of automobiles and motor trucks during the next five months of this year promise to outstrip the sales for the last seven months, due to the much lower prices permitted by the new tariff and also to the fact that dealers are bringing in new models.

## *BANK WILL SURVEY USED CAR MARKET*

**ST. LOUIS, Aug. 13—Officials of the National Automobile Dealers Association endorse the movement which the Federal Reserve Bank proposes to inaugurate to incorporate in its surveys a report on the used car market.**

**In a letter forwarded to the headquarters of the association, the bank outlines its plan and points out that it will in no way interfere with the study the N. A. D. A. is making of the used car situation.**

# Pacific Slope Sales Doubled in 4 Months

## This Year Five States Sold 90,240 Cars Against 43,703 in Same Period, 1922

SAN FRANCISCO, Aug. 10—States of the Pacific Slope more than doubled their sales of passenger automobiles for the first four months of 1923, as compared with the same period of 1922, according to figures compiled by John Perrin of the Federal Reserve Bank of San Francisco, on five of the Pacific Slope States. Perrin's figures are as follows:

| | Passenger Automobiles | |
|---|---|---|
| States | First 4 months of 1923 | First 4 months of 1922 |
| California | 71,463 | 38,078 |
| Oregon | 10,926 | 3,801 |
| Arizona | 2,816 | 903 |
| Utah | 2,700 | (unavailable) |
| Idaho | 2,336 | 921 |
| Total | 90,240 | 43,703 |

In the same territory during these same four months of 1923, there were 8173 commercial vehicles sold, as compared with 4283 last year, according to Perrin's figures.

**Growth in Six Months**

Registration figures for the first half of 1923 as compared with the same period of 1922, for six States of the Pacific rebion also are included in this report, as follows:

| States | First half of 1923 | First half of 1922 |
|---|---|---|
| California | 901,274 | 699,908 |
| Washington | 182,443 | 141,806 |
| Oregon | 130,868 | 106,380 |
| Utah | 49,174 | 35,997 |
| Idaho | 49,070 | 42,865 |
| Arizona | 40,108 | 31,735 |
| Total | 1,353,471 | 1,058,691 |

The total for the six States shows a gain of 27.8 per cent over last year, distributed as follows: California, 28.7 per cent; Washington, 28.6; Oregon, 23.0; Utah, 38.1; Idaho, 14.4; Arizona, 26.3. Owing to her great mileage of paved highways, California retains her lead in registrations by an overwhelming percentage, but the widespread influence of the automobile is shown clearly in the fact that every one of the other Pacific Slope States mentioned has large highway-construction programs mapped out and work under way on all of them.

### OLDS ALTERING PLANT

LANSING, MICH., Aug. 13—Extensive plant alterations at a cost of several million dollars have been started by the Olds Motor Works. The entire engine plant is being remodeled and made ready for increased production in the fall. The assembly quarters and facilities of the company are also being enlarged, and the capacity of the enameling plant is being increased.

# Texas Dealers Clear Stocks of Used Cars

## Avail Themselves of Slow Months —Not Accepting Many on Trade-in Basis

DALLAS, TEX., Aug. 13—With a cotton crop estimated at between 3,500,000 and 4,000,000 bales, valued at between $400,000,000 and $500,000,000 beginning to reach the market in Texas, the retail automobile dealers, who are stocked up with new cars, are anticipating the best business in years. The automobile business in Dallas and Texas generally has been slow for some sixty days. The dealers expected it and utilized the greater part of the time in working off used car stocks. July and August are the doldrums in the business in Texas any year and 1923 was no exception. The retailers, however, declare they sold more cars than many of the big districts in the north and east, and that business in Texas all the year has been far better than in many sections of the country.

The average sale of new cars monthly by Dallas dealers for the first seven months was more than 1,100. The used car figures are not available, but it is probable that as many used cars were bought as new ones.

The dealers throughout Texas have been putting on used car sales recently. Some cities, Houston, for instance, had a "used car week" in which the retailers devoted their energies to moving used cars. At the special sales and in the "used car weeks" the dealers moved the majority of the used stock.

Retailers are not taking in many used cars now on a trade-in basis. They are merely selling them for the owners.

Dealers and distributors are expecting good business for the remainder of the year. Farmers have been inquiring for cars of various makes for some time. The closed car appears to have the biggest demands in towns and cities now. There is a growing demand for the closed car in the rural districts.

Truck sales are certain to increase during the next few months, dealers say.

# Coats Steam Car Receiver Given Additional Powers

COLUMBUS, OHIO, Aug. 15—Upon the application of several Columbus creditors, John G. Price, former attorney general of Ohio, who was named receiver for the Coats Steam Car Co. of Columbus, under the State courts, has been named receiver by the United States District Court under the bankruptcy proceedings.

This combines the two actions and throws the question of liquidation into the Federal courts, thus protecting creditors from outside the State.

Price is now making an inventory of the assets, which consist of the plant on South High Street, automobiles in process of construction, considerable raw materials and some machinery. The principal item is the real estate which is involved in a suit, and in which there will not be much equity for the creditors.

A total of about $20,000 had been paid in by agents as advance payments on cars, and of that amount about $11,000 was returned. The remainder is being held by the banks in which it was deposited.

# FINANCIAL NOTES

**Weaver Manufacturing Co.**, Springfield, Ill., has certified to the secretary of state to an increase of capital stock from $250,000 to $500,000, representing a transfer of surplus funds to capital stock in the form of stock dividend. No new stock will be offered for sale, G. E. Weaver, treasurer, states. The company manufactures garage and shop equipment. A one-story brick addition, 100 x 200 feet, and a two-story brick office building are contemplated. I. A. Weaver is the company's president.

**Borg & Beck Co.** reports July net earnings of $31,191 before taxes, which is a substantial improvement over the estimate of from $22,000 to $25,000 made a week ago by officials of the company.

**Eaton Axle & Spring Co.** has declared the regular dividend of 65 cents, payable Oct. 1 to stock of record Sept. 15.

# Templar Motor Receiver Would Sell Most Assets

CLEVELAND, Aug. 16—T. L. Hansman, receiver for Templar Motors Corp. since Oct. 6 has petitioned the Federal Court here to sell the real estate plant and other assets of Templar. He declared that he believes the interests of the creditors could be best conserved by the sale of the physical assets of the estate, by which he explained he meant everything but the bills, cash, accounts receivable and similar items.

He asked that the Guardian Savings and Trust Co., which holds a mortgage securing a $1,000,000 issue of bonds, and County Treasurer Ralph C. McBride to whom is due unpaid taxes, be made parties in the sale with the receiver.

Hausman said claims filed against the estate total $1,653,888 and assets are appraised at $1,421,450 for plant and equipment; $171,357 for automobiles completed and under construction, parts and materials; and $76,001 for goodwill, patents and other intangible assets. This totals $1,668,818, approximately $15,000 in excess of claims.

### BRITISH REGISTRATION GAINS

NEW YORK, Aug. 14—A cable from London states that motor vehicle registration in Great Britain increased 153,000 the first half of this year over the corresponding period of 1922, bringing the total to date to 978,000. Of this total 346,000 are passenger cars, an increase of 70,000; 166,000 trucks, an increase of 21,000, and the remainder, 387,000, motorcycles.

# BANK CREDITS

*Written exclusively for* AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

The prevailing quiet of general business was accentuated by the pause incident to the death of the late President. But no semblance of panic appeared anywhere because of the unexpected change in the headship of the Government.

The Government forecast as of Aug. 1, estimating the wheat crop at 793,000,000 bushels, or 28,000,000 bushels less than last month's figure, caused a distinct rise, sending quotations again above a dollar. Corn prices were firm in the face of an estimated production of 105,000,000 bushels above the forecast last month.

Steel buying continues to improve, while production declines. The output of steel ingots in July was 2½ per cent less than in June, and the production of pig iron declined by a similar percentage. Unfilled orders of the United States Steel Corp. on July 31 aggregated 5,910,763 tons, marking the fourth successive monthly decline, and a recession of 7 per cent since June 30.

### Record in Car Loadings

The record of 1,041,044 car loadings during the week ended July 28 is the largest in the history of the railroads, and exceeds by 12,117 the record established the week before. The earnings of Class I railroads in June represented an annual rate of 5.47 per cent on the tentative valuation fixed by the Interstate Commerce Commission, as against a rate of 6.33 per cent in May. The decline was due to a decrease in the earnings of the western roads, which, according to recent reports, are now making a better showing.

Professor Irving Fisher's index of commodity prices last week remained at 153—the level reached four weeks earlier—while Bradstreet's food index for the week ended Aug. 9 rose one cent to $3.12.

Bank debits to individual accounts reported by the Federal Reserve Board for the week ended Aug. 8 total $8,256,000,000, a decline of 5 per cent from the preceding week, but an increase of 2.3 per cent over the corresponding week last year.

### Bank Discounts Increase

Discounts by Federal Reserve banks during the week ended Aug. 8 showed an increase of $16,700,000, mostly in bills secured by Government obligations.

# Oakland Lets Down Bars on Restricted Territory

DETROIT, Aug. 16—The Oakland Motor Car Co. has changed its selling policy, abolishing to a certain extent restricted territory. Dealers are protected within corporate limits of their town, city or village.

Outside of this limit however, the field is open to any dealer. Thus, dealers in two neighboring towns can compete for business in open territory between towns.

## INDUSTRIAL NOTES

**Christensen Engineering Co.**, Milwaukee, manufacturer of compressed air engine starters and other automotive equipment, has been placed in the hands of Julius J. Goetz as receiver. The concern was organized in 1916 to manufacture inventions of Nels A. Christensen, a pioneer engineer in the pneumatic equipment field. Starters for fire apparatus and aircraft were the principal product.

**Wilson Foundry Co.** of Pontiac, Mich., a subsidiary of the Willys-Overland Co., is spending about $1,500,000 on plant extensions which will double its capacity for the manufacture of Willys-Knight engines and Overland engine parts. These extensions will be completed by Jan. 1, when 400 additional workmen will be taken on. An output of 500 Knight engines a day is expected to be reached by next spring.

**Dyer Co.** of Cambridge, Mass., manufacturer of oxy-acetylene welding equipment and automobile parts, has established a factory office and salesroom at 1526 Vine Street, Philadelphia, in charge of T. Scott Eavenson, who will look after Pennsylvania, New Jersey, Maryland, the Virginias and North Carolina.

**Fisher Body Corp.** has obtained a permit for the erection of a three-story brick and concrete power house adjacent to the main building of the Fisher plant in Detroit.

**Grimm Aluminum Casting Co.** of Manitowoc, Wis., has broken ground for a brass and aluminum casting foundry to be ready about Oct. 1.

**United States Electrical Tool Co.** has moved its Detroit district office to 50 Canfield Avenue, East, and its Columbus, Ohio, office to 509 North Park Avenue. At both these new locations the company will carry a large stock of tools and each will have a well equipped service station.

**Detroit Steel Corp.'s** new strip steel plant will be in production Oct. 1 if the present progress is maintained, according to W. C. Schrage, president. The new plant is located in Oakwood, Mich., and is adapted specially to the manufacture of strip steel.

**Marion Steel Body Co.**, which will manufacture steel commercial automobile bodies, will be launched at Marion, Ohio, by Thomas H. Clark and E. H. Fishmer, formerly of Galion. The factory will be in operation within two weeks.

**Forest Electric Co.**, Newark, N. J., manufacturer of automotive equipment, has occupied a new manufacturing plant which it has erected at the corner of New and Wilsey streets, that city. The building has 12,000 feet of floor space.

**Oilgear Co.** of Milwaukee, manufacturer of hydraulic presses, broaching machines, variable delivery pumps and variable speed drives, has moved its office and factory into larger quarters at 398 Thirty-eighth Street, that city.

**Standard Steel & Bearings, Inc.**, has moved its Philadelphia plant to the new location at Plainfield, Conn., where it has a spacious one-floor plant to house an unhampered arrangement of tools and equipment.

### PIERCE-ARROW FILES SUIT

BUFFALO, Aug. 10—Papers were filed last week in Federal court by the Pierce-Arrow Motor Car Co. in their suit to recover $37,500 which they allege was illegally collected by the Government in taxes during the war. The suit is the outcome of the sale of 378 automobiles to the French Government on which the Government collected tax. The trial of the action has been held in abeyance pending decision on a similar case now before the United States Supreme Court.

## Labor Accident Rate Low in Automotive Industry

WASHINGTON, Aug. 13 — Statistics of industrial accidents compiled by the Bureau of Labor Statistics, Department of Labor, show that accident rates in the automobile industry, both frequency and severity, are low. The department claims that their accident data taken from January to June, 1922, cover a very large fraction of the workers engaged in the production of automobiles.

Regarding the automobile industry, the report states: "On the whole accident frequency was increasing and accident severity decreasing, the rise in frequency probably being closely related to the fact that the period covered was one in which there was a constantly augmented number of workers."

This special report recommends that "two things ought to be done regarding industrial accidents: (1) They should be prevented. (2) Such as cannot be prevented should be adequately compensated."

## N. A. D. A. Making Plans for Uniform Lien Law

ST. LOUIS, Aug. 15—It has been recognized for some time past that the wide variance of lien laws throughout the country carried an element of danger to automobile dealers.

The National Association of Automobile dealers has taken cognizance of this condition and W. B. Spalding, general claims attorney, is engaged in compiling a digest of all laws of the various States on the subject with a view to writing a uniform measure to be laid before the legislative bodies of all the States for adoption.

Recently officials of N. A. D. A. were approached by the National Motor Vehicle Association urging that the survey and compilation be made. This request was not received, however, until the work was well under way.

## Wisconsin Parts Moves Savage Axle to Oshkosh

OSHKOSH, WIS., Aug. 13—Enlargement of the plant of the Wisconsin Parts Co., Oshkosh, Wis., manufacturer of axles, will be necessary to accommodate the increased business as well as the physical equipment acquired by the purchase of the entire motor truck axle department of the Savage Arms Corp., Sharon, Pa., and Utica, N. Y. Additional machinery is already being installed to the limit of existing plant area. The purchase gives the Wisconsin company all of the Savage axle department inventory, including dies, tools, patents, patterns and designs.

## METAL MARKETS

**To all appearances the market for steel products has entered upon the twilight hour which always precedes the reawakening of demand. While so far there has been no evidence of a fresh buying movement in so far as the actual placing of orders is concerned, and while productive activities are rather on the down than the uptrend, the greatly improved sentiment that pervades the market is predicated on quite substantial developments. Among the outstanding harbingers of a change in conditions is a marked improvement in the scrap situation.**

**Dealers in this commodity while of a speculative turn of mind, have, as a rule, a canny insight into conditions at the steel mills. Their business calls for this accomplishment. Their eagerness for scrap at this time indicates that they have seen the reserves in mill yards dwindle, and that they know buying on a large scale is just around the corner. Then again, amid the utterly untested market conditions which prevailed in July, there was no telling just what degree of firmness adhered to the nominal prices quoted.**

**Prospective buyers who have sounded the market in the last few days have found that much of the vagueness has given way to firm maintenance of quoted price levels. A few weeks ago a sales manager might say to a bargain hunter: "Give us a firm order with specifications to figure on, and we will see what we can do." To-day, there is enthusiastic fidelity to prices and, in the few products that during the extreme lull displayed a softening tendency, buyers are given to understand that they must make haste if they would take advantage of the relatively low prices.**

**Hot-rolled strips, for instance, are still obtainable from many of the mills at $6 a ton below the 3.30 cents level, looked upon as the regular quotation, but in order to secure acceptance of orders for representative tonnages at the 3 cent level, specifications must be more than attractive to the mill.**

**Consumers consider the 3 cent price, when obtainable, sufficiently inviting to initiate negotiations for fourth quarter requirements. The cold-rolled strip steel price has settled at 5 cents. Sheet bars have firmed at $42.50. Most of the sheet mills are protected against sheet bar rollers' own reductions, and the incentive to keeping prices on an even keel is well explained by this practice. The eight-hour day is being introduced without delay. At the New Castle plant of the Carnegie Steel Co., 900 employees went on the eight-hour basis on August 16.**

**Pig Iron.**—The morale of producers is considerably better than the demand. Concessions demanded by prospective buyers meet with a cool reception from sellers who believe that with still more furnaces going out of blast, the market's equilibrium will soon be re-established.

**Aluminum.**—The consuming demand has dwindled to odd lots for immediate requirements. In such cases price depends entirely upon how urgently the material is needed. When a resale lot is peddled around, price depends upon how urgently the holder needs the money.

**Copper.**—Further reductions in copper and brass products have been made to stimulate the demand. Due to the European situation, stocks of refined copper in the United States are again piling up.

**Tin.**—The market has turned dull and scalping by professionals is its outstanding activity.

# Calendar

**SHOWS**

Nov. 4-10—New York, First Automobile Exposition of the Foreign Automotive Association, Hotel Astor.

Nov. 11-17—New York, Annual Automobile Salon, Hotel Commodore.

Jan. 26-Feb. 2—Chicago, Annual Automobile Salon, Hotel Drake.

**FOREIGN SHOWS**

Sept. 28-Oct. 7—Berlin, Automobile Show.

Oct. 4-14—Paris, Passenger Cars, Bicycles, Motorcycles and Accessories, Grand Palais.

Oct. 15-20—London, Motorcycle Show, Olympia.

Oct. 24-Nov. 2—Paris, Trucks, Agricultural Tractors, etc., Grand Palais.

Nov. 1-15—Buenos Aires, Annual Automobile Exposition, under the direction of the Automovil Club Argentino.

Nov. 2-10—London, Automobile Show, Olympia.

Nov. 22-Dec. 1—London, Motor Transport Exhibition.

Dec. 8-19—Brussels, Passenger Cars, Trucks, Airplanes and Motor Boats, Aviation Palace.

**RACES**

Sept. 3—Annual Pikes Peak Hill Climb.

Oct. 28—Barcelona, Spain, Grand Prix for vehicles of 1500 c.c.; Nov. 1, International Grand Prix for cycle cars of 1100—Nov. 4, International Grand Prix for two liter.

**CONVENTIONS**

Sept. 19-21—Boston, Fall Meeting of the Motor and Accessory Manufacturers Association.

Oct. 24-26—Cleveland, Thirtieth Annual Convention of the National Association of Farm Equipment Manufacturers, Hotel Statler.

Nov. 12-17—Chicago, Annual Business Exhibit and Convention of the Automotive Equipment Association, Coliseum.

**S. A. E. MEETINGS**

Oct. 25-26—Production Meeting of the S. A. E.—Cleveland.

Jan. 1924—Annual Meeting of the S. A. E.—Detroit.

## Zenith Cup Won by Farman Biplane

PARIS, Aug. 4 (*by mail*)—With gasoline costs of 15 cents per ton-mile, Bossoutrot, piloting a Farman biplane fitted with a Salmson 260-hp. engine, won the first competition for a cup to be put up for three successive years by the Zenith Carbureter Co.

This was the first airplane competition in the world on a fuel basis, the contestants being called upon to fly from Paris to Lyons and return, a distance of 478½ miles, at a minimum average of 44 m.p.h., and to show the lowest possible gas consumption on a ton-mile basis.

The winner carried a useful load, pilot excluded, of 1098 lb., with a consumption of 519.7 lb. of gasoline, his gas consumption therefore working out at 1.04 lb. per kilo of useful load carried. At present rate of exchange, and for gas purchased on the French market, this gives a cost of 15 cents per ton-mile useful load.

Roques in a Potez, fitted with an 80-hp. Anzani engine, was second with a useful load of 339 lb., with a consumption of 207.5 lb. of gasoline, giving him 1.35 lb. per kilo of useful load carried. Becheler in a Hispano-Caudron of 180-hp. was third with a useful load of 441 lb., a consumption of 406.5 lb. of gasoline and 2.02 lb. per kilo of useful load carried. Finat in a 15-hp. Vaslin-Dewoitine; Lafon in an 80-hp. Anzani-Potez and Vanlaere in a 180-hp. Hispano-Caudron did not finish.

The rules made it possible for any kind of plane to take part, and the six sent away from Orly airdrome in the suburbs of Paris were indeed a varied set.

## Savings in Iowa Banks Increased During June

DES MOINES, IOWA, Aug. 15—Money in Iowa savings deposits July 1 was 2.1 per cent greater than on June 1 and shows a 14.3 per cent increase since June 1, 1922, according to Federal Reserve Bank statistics for the seventh district which show that Iowa compares favorably with other States in the area. Savings totaled $94,736,133 in 55 Iowa banks, representing an increase of 1.1 per cent in the average savings account.

The report says:

No marked change in the credit situation appeared, but the demand in some agricultural sections is reflected in the reduction of country bank balances and in seasonal increase in accommodations by city banks to country correspondents. Borrowings will be reduced when the proceeds of the harvest are available.

In some sections farmers seem disposed to hold their wheat crop because of the present low prices, but in other sections it is anticipated that wheat will come on the market direct from the thresher, which will tend to ease the demand from agricultural sections as well as help liquidate their obligations.

## Austria Wants Tariff on Ad Valorem Basis

WASHINGTON, Aug. 15—A revision of Austrian tariffs as applied to imported automobiles and accessories is being sought by the automobile manufacturers of that country, according to advices received by the United States Bureau of Foreign and Domestic Commerce.

The present tariff provides for import duty on automobiles, trucks, etc., on a basis of weight. In application the tariff on high grade cars amounts to from 6 to 7 per cent ad valorem, while on the lower and lighter weight cars it amounts to from 35 to 45 per cent ad valorem.

The Austrian manufacturers are pressing jointly for an amendment to the tariff law which would put all automotive equipment duties on an ad valorem basis. They are asking a duty of 33 1/3 per cent, and present indications are, the advices state, that they will soon be granted the new tariff asked. If passed, the new law will be a big disadvantage to the American manufacturer of high grade cars, but will help the lower grade cars.

### BENZOL PLANT BURNED

MILWAUKEE, Aug. 13—The entire benzol plant of the Milwaukee Coke & Gas Co., one of the largest sources of supply of benzol for gasoline mixtures as motor fuel in the Middle West, was wrecked by explosion and fire, which caused a loss of $250,000.

## Tractor Sales Drop Through Southeast

ATLANTA, GA., Aug. 14—Although power farming machinery and tractor sales in the Sixth Federal Reserve District, which comprises the group of Southeastern States, were somewhat less during June than they were during May, they were substantially better than they were during June, 1922, according to the report of the Federal Reserve Bank of Atlanta, covering commercial and industrial conditions in the district during June.

Implement and tractor sales in the district for the first six months of the year were approximately 25 per cent better than the first six months of 1922, the report shows, and according to the seven distributors supplying the information the first half of 1923 experienced the biggest volume of implement and tractor sales in the history of the Southeast.

Financially and agriculturally, the report states, the section is in excellent shape, with the outlook promising a good volume of business through the rest of the year.

## British Talk Grand Prix at Brooklands Next Year

LONDON, Aug. 4 (*by Mail*)—At a luncheon given by the Royal Automobile Club to the Sunbeam Co. to celebrate its recent victory in the French Grand Prix, Louis Coatalen suggested that a British Grand Prix be held in 1924.

Brooklands, he thought, could reproduce the conditions of an international road race by making cars come up the finishing straight every lap, a sharp bend being built in it to compel drivers to use brakes, change gear and accelerate once every circuit. This would provide the equivalent of a difficult corner once every 2½ miles. It is possible this suggestion will be adopted.

### NEWFOUNDLAND TARIFF

WASHINGTON, Aug. 14—A 45 per cent ad valorem duty will be collected on tires shipped into Newfoundland in the future. The new tariff becomes effective immediately.